

ZS 72

British Birds

AN ILLUSTRATED MONTHLY JOURNAL

Edited by

P. A. D. Hollom E. M. Nicholson
I. J. Ferguson-Lees Stanley Cramp

Photographic Editor: Eric Hosking

Hon. Editors: W. B. Alexander N. F. Ticehurst

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PURCHASED

British Birds

Vol. 54 No. 1
JANUARY 1961



Four invasions of Waxwings during 1956-60

By R. K. Cornwallis

INTRODUCTION

THE WAXWING (*Bombycilla garrulus*) has a Holarctic breeding distribution in the boreal zone (see Fig. 1) reaching the July isotherm of 50° F and extending from Fenno-Scandia right across the Eurasian land-mass and into north-western America. There are three recognised races: the nominate race in western Eurasia; *B. g. centralasiae* eastwards from western Siberia; and *B. g. pallidiceps* in the Nearctic. In central and eastern North America it is replaced by another member of the genus, the Cedar Waxwing (*B. cedrorum*), and in northern Manchuria, Sakhalin Island and Japan by a third, the Japanese Waxwing (*B. japonica*).

Throughout its range it is noted for its irregular winter migrations. Britain and Ireland, lying on the extreme Atlantic edge of even the extended winter range, are reached by these winter migrations only occasionally and when they are on an unusually large scale, though a few Waxwings occur in eastern counties in most years. In the winters between 1956-57 and 1959-60, however, there were four successive invasions of our islands, a series unprecedented since records have been kept. In the following pages their progress both in Britain and Ireland and in Scandinavia is described and the underlying causes of this type of migration are discussed.

PART I—THE INVASIONS

1956-57

The 1956 breeding season in Scandinavia

During the summer of 1956 Waxwings were recorded as breeding in Scandinavia (well to the south-west of the normal range) in unusual numbers. The main concentration was along the Swedish shore of the Gulf of Bothnia, but birds were also reported from a wide area of central Scandinavia and even as far south as Stockholm.



FIG. 1. Normal breeding range of the Waxwing (*Bombycilla garrulus*) in north-east Europe, northern Siberia and north-western North America, shown in black. The ranges of the other two members of the genus, the Cedar Waxwing (*B. cedrorum*) and Japanese Waxwing (*B. japonica*), are also roughly indicated

In the previous winter of 1955-56 Waxwings were not numerous in Sweden and it seems unlikely that these breeding birds were left over from the winter-flocks, as has usually happened when they are found breeding outside the normal areas. It seems more probable that there was an overflow movement in the early spring from Finland and the Archangel area where heavy breeding was reported. This is supported by a record of a southerly movement in spring in Ångermanland in central Sweden (Hansson and Wallin 1958).

The progress of the invasion in autumn 1956

The autumn of 1956 was one of superabundance of rowan berries (*Sorbus aucuparia*) over the whole of Fenno-Scandia and the north-western parts of the Baltic countries, but in most parts of the Soviet Union they were scarce. In spite of the rich food supply in the

breeding areas of Fenno-Scandia many Waxwings appear to have emigrated very early compared with most seasons. Already in October there were considerable concentrations in northern Sweden and in the Stockholm area, and in November and December these concentrations became widespread over the whole of central and northern Sweden.

It has been possible to trace the origin of the flocks comprising the invasion to two separate areas, one in Scandinavia and one further east (Hansson and Wallin 1958). The earlier concentrations that gathered in Sweden in October, November and December appear to have come from the abundant breeding that took place, as has already been shown, in the western part (and beyond) of the normal range. By 1st January some 10,000 birds were concentrated in Östersund (central Sweden). During the last week of December and the first week of January there was a further concentration in southern Finland where Waxwings had previously been rather scarce. It seems reasonable to suppose that these birds came from further east, where the berry supply was poor, but it may well be that before their appearance in southern Finland they had been arrested for a time in the area between the White Sea and Finland where berries were abundant. Breeding birds in the Archangel area were reported to have emigrated early and probably moved into this region.

The wave of Waxwings coming from the east culminated along a line from Haparanda (at the head of the Gulf of Bothnia) to Leningrad (at the head of the Gulf of Finland) about 15th January, at the same time as the concentration of flocks reached its maximum in northern Sweden where, on the 13th, there were 10,000 in the Kalix area at the head of the Gulf of Bothnia.

Thereafter the concentrations of Waxwings resulted in exhaustion of the berry supply and the birds began to move. It has been possible to trace the movements of the two contingents by successive culminations in numbers in different places. One part of the influx from the east followed the Gulf of Finland directly westwards into central Sweden, while another flowed north of the Gulf of Bothnia and down along the east coast of Sweden, spreading a little inland to central Scandinavia. The Scandinavian contingent, on the other hand, moved in a south-easterly direction, meeting or crossing the westward inflow in Uppland and the valley of Lake Mälaren (immediately to the west of Stockholm). This caused a remarkable concentration of Waxwings in this area and by 4th February there were 10,000 in Uppsala (the province immediately north of Stockholm).

These movements continued and developed in mid-February into a westward and south-westward overflow out of Scandinavia. This overflow took two main directions, one across southern Norway and reaching eastern Britain, the other via Denmark and Gotland down to

central Europe and, especially, to northern Germany and the Netherlands. These probably represent respectively the westerly and south-easterly streams described above. Waxwings were noted in Rogaland, at Revtingen and at Lillehammer (north of Oslo) (all in southern Norway) from early February; and the main arrivals in Britain occurred between 11th and 20th February. An illustration of this westerly movement is provided by a bird that was ringed on Signilskär (the Finnish bird observatory on the Åland Islands midway between Sweden and Finland at the level of Stockholm) on 7th December and recovered near Oslo on 27th February. The other movement took place at about the same time, the first birds being reported from the Frisian Islands on 8th February and numbers building up rapidly in Holland from the 16th (Taapken 1958). A ringing recovery illustrates this movement also, a bird marked in Uppsala on 4th February (the date when the maximum concentration in that area occurred, as mentioned above) being found in mid-Baltic at Visby (on Gotland) on 17th March.

Not all the birds left Sweden, however, and large numbers remained there in the second half of February and throughout March. The supply of rowan berries was by now becoming exhausted, but, in contrast to their behaviour earlier, when they moved out of central Sweden as this food became scarcer, birds that remained now turned increasingly to emergency foods. An example of a bird that did not move far is one ringed in Uppsala on 4th February (the same day as the one recovered on Gotland) which was recovered near Stockholm on 24th February (Hansson and Wallin 1958).

The invasion in Britain during February and March 1957

Early forerunners of the main invasion were noted in late January when 18 were reported from Dunkeld (Perthshire), two from Aberfeldy (Perthshire) and some 200 from Pegswood (a suburb of Newcastle upon Tyne, Northumberland). Unfortunately none of these early reports is well-documented and certainty about dates is not possible. In early February two were recorded at Lossiemouth (Morayshire) on the 3rd and six from Duffus near-by on the same day.

The main invasion, however, seems to have started on 11th February. On this day one was found dead in Orkney and on the next day there were records from Fair Isle, Orkney and eastern Sutherland. By the 17th (which was a Sunday and therefore probably gave extra opportunities for observations) Waxwings were established all down the east coast, being widely reported in the eastern Highlands, the eastern Lowlands, Northumberland, Co. Durham and south to Lincolnshire, Norfolk and Essex. The majority of these birds were singletons or in small parties, but the large party at Pegswood was still together. The 19th saw a crop of new reports, 17 passing at Spurn Observatory

WAXWING INVASIONS DURING 1956-60

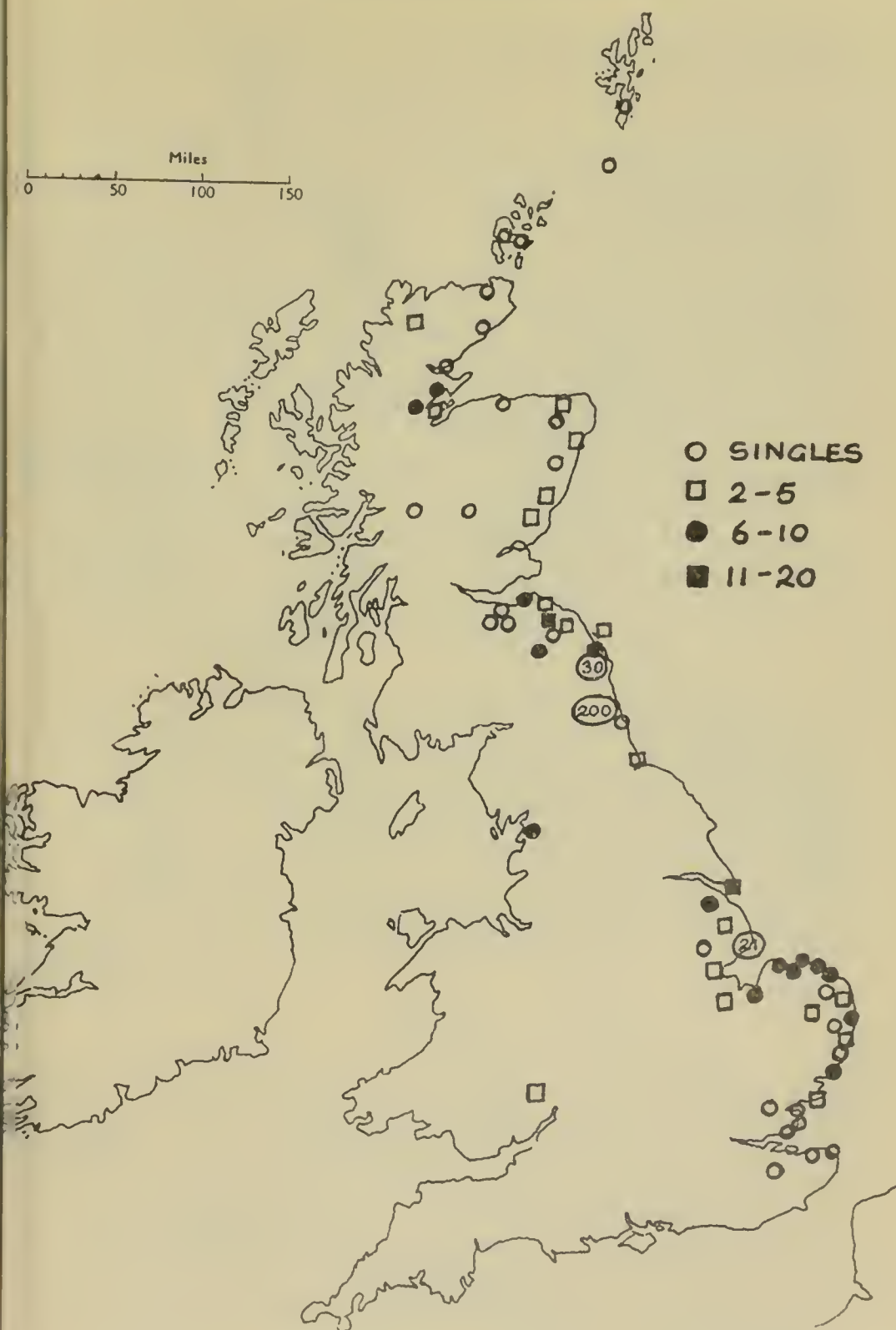


FIG. 2. Waxwings (*Bombycilla garrulus*) in Britain, 11th-20th February 1957

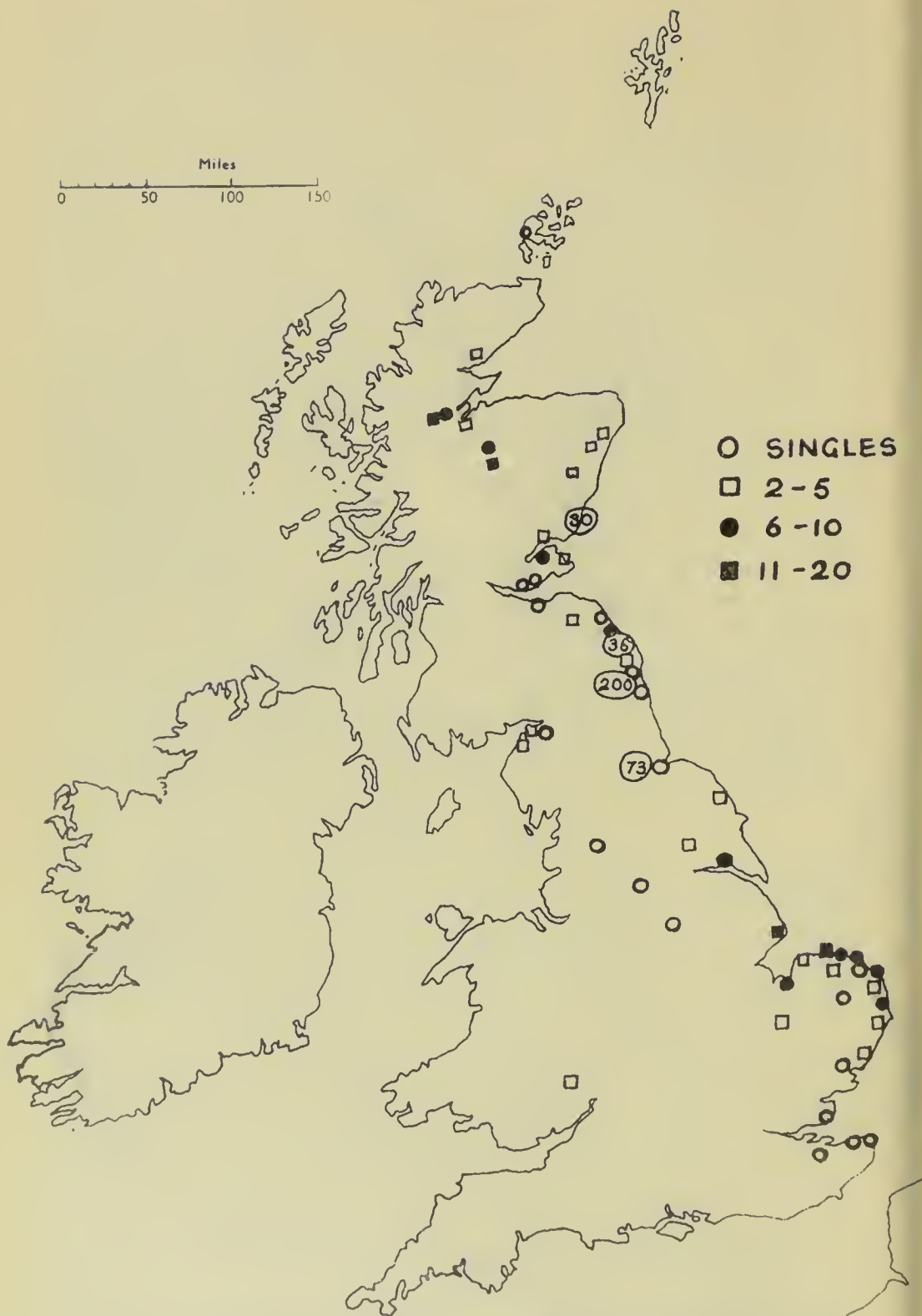


FIG. 3. Waxwings (*Bombycilla garrulus*) in Britain, 21st-28th February 1957

(south Yorkshire), 21 arriving at Skegness and others being noted elsewhere in Lincolnshire. Birds were almost confined to the east coast, the chief exception being six that were noted on the 18th near Yealand (north-west Lancashire) (Fig. 2).

During the week 21st-28th February the pattern of distribution remained much the same, but the birds were gathering into larger flocks. A few stragglers were reported from the Midlands at this time (Fig. 3).

In early March concentration became even more marked, particularly in the Inverness, Fenwick (Northumberland), Pegswood and Middlesbrough (Yorkshire) areas, but further south there were already signs of dispersal, far fewer being recorded in Lincolnshire and north Norfolk. The main parties here were in east Norfolk and on the Suffolk coast. During the second and third weeks of March the numbers of reports fell steadily, though there were still 20 in Gosforth Bird Sanctuary, Newcastle upon Tyne, on the 30th and 14 were seen at Boat of Garten near Aviemore (Inverness-shire) on the 31st (Fig. 4). This area also saw the last recorded flock (of 42 in Rothiemurchus) on 11th April, although odd birds were reported from Carlisle, Hull and Scarborough in April and the latest report of all came from Quorn (Leicestershire) where there were two on 26th April.

Return movements in spring 1957

The return movements in Sweden began in March, but reached extensive proportions only in April. Waxwings were seen to fly out over the sea from the coast of Uppland, indicating a considerable strength of the migratory urge (Hansson and Wallin 1958). In Holland much the same pattern as in Britain was observed—most of the birds left by mid-March with a few stragglers in late March and into April (Taapken 1958). By the end of April almost all had moved away out of western Europe and Scandinavia, presumably back to their northern breeding grounds.

1957-58

The 1957 breeding season

As noted above, there was an extensive return movement of Waxwings through Sweden in March and especially April 1957. Not all these birds, so it appears, regained the normal easterly breeding range of the species. For once again there was extensive nesting this side of the usual areas. But, whereas in 1956 these extra-limital breeders seem to have moved westwards in the spring because of over-population in the normal range, in 1957 they were birds left over from the great invasion flocks of the previous winter.

There were two main areas of density—one in central Sweden around the 64° parallel and another north of the Arctic Circle on the 68°

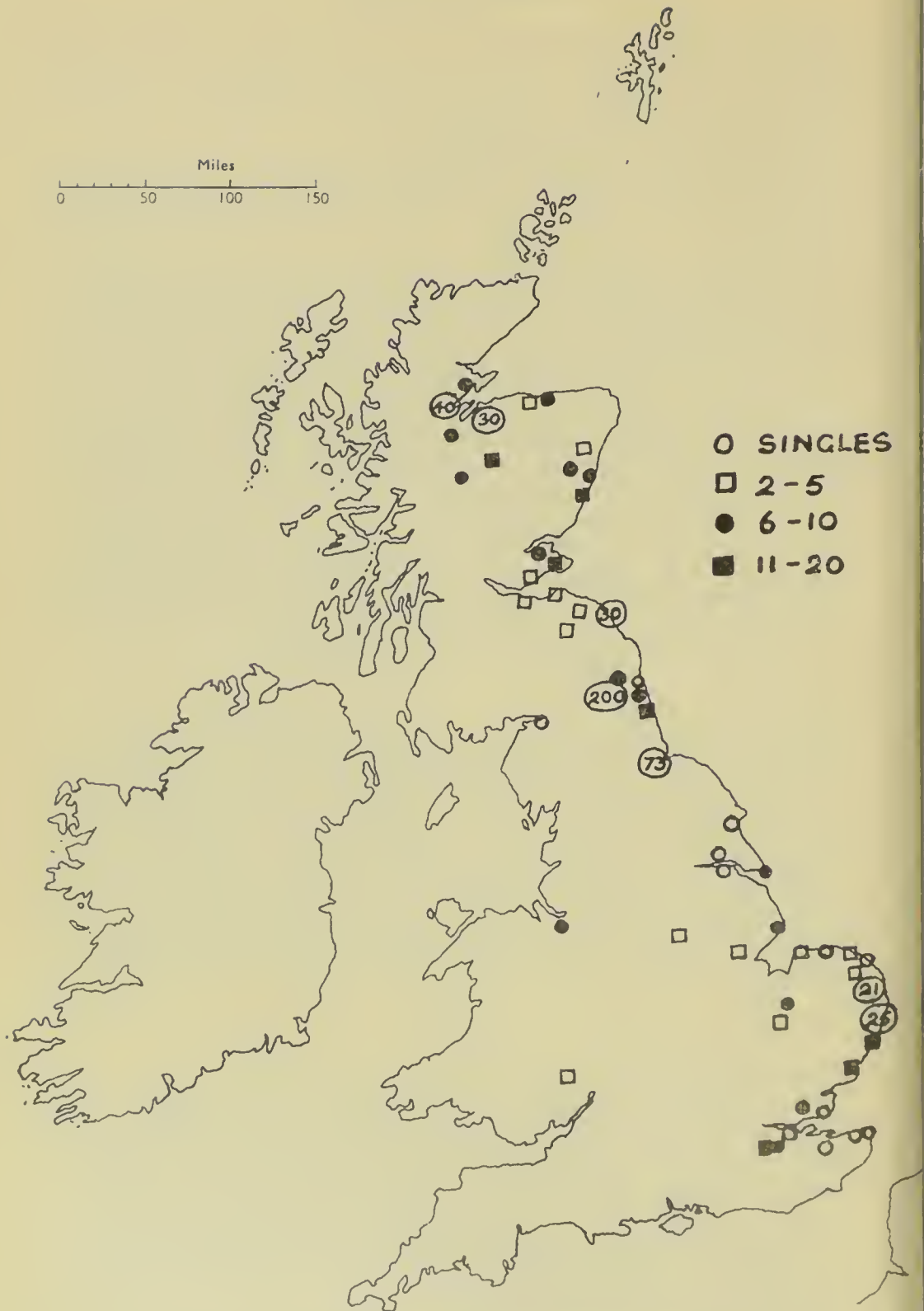


FIG. 4. Waxwings (*Bombycilla garrulus*) in Britain, March 1957

parallel. In addition, however, many pairs of Waxwings were noted even south of a line Oslo-Stockholm (L. Wallin *in litt.*).

The progress of the invasion in autumn 1957

As Svårdson (1957) had predicted, the crop of rowan berries in the autumn of 1957 was almost a total failure in Fenno-Scandia as a result of exhaustion following the very heavy crop of 1956. In consequence, the passage of the Waxwing flocks through Sweden was very rapid and, indeed, difficult to observe, since the birds did not stay anywhere for any length of time. That at any rate some of the migration took place at night was established by observations made at Falsterbo. The movements recorded were also rather early in the season, no doubt as a result of early exhaustion of the food supply in the breeding areas themselves. The only considerable numbers were noted at Signilskär on the Åland Islands. Here, on Gotland and elsewhere on a much smaller scale the principal movements were noted in the second half of October. The migratory flocks, therefore, moved early and uninterruptedly out of the breeding range until they found food supplies, the fore-runners of the invaders to Britain being noted in the first week in November and the flocks being well-established by the middle of the month (L. Wallin *in litt.*).

The invasion in Britain and Ireland from November 1957 to March 1958

The first indications that a new immigration of Waxwings to Britain and Ireland was under way came in the first week of November, the earliest records being from the southern Highlands and, rather remarkably, from the north of Ireland and west Wales (single birds at Downpatrick and Dolgelly on the 5th and 3rd respectively). By the 10th records were becoming more numerous and birds had been reported from places as widely apart as Shetland, Rhum, Cumberland, Lancashire, North Wales, Pembrokeshire, Essex, London, Norfolk, Leicestershire, Co. Durham and East Lothian. During the rest of the month numbers built up rapidly, the main concentrations being in the Moray Firth area, all down the eastern seaboard of Scotland from Aberdeen to the border, around Newcastle upon Tyne and in Norfolk and Suffolk. On the 22nd, 150 were seen coming in off the sea at Tweedmouth and 25-30 left the Farne Islands on the 24th, heading for the mainland. In contrast to the invasion of the previous winter, records were commoner away from the east coast and during the second half of the month numbers had been reported from North Wales and the Midlands and a scatter of single birds along the south-west coast as far as Plymouth (Devon) (Fig. 5).

During December, although the main concentrations remained in much the same places all down the east coast, the total numbers involved steadily diminished. Scattered reports continued to come from

BRITISH BIRDS

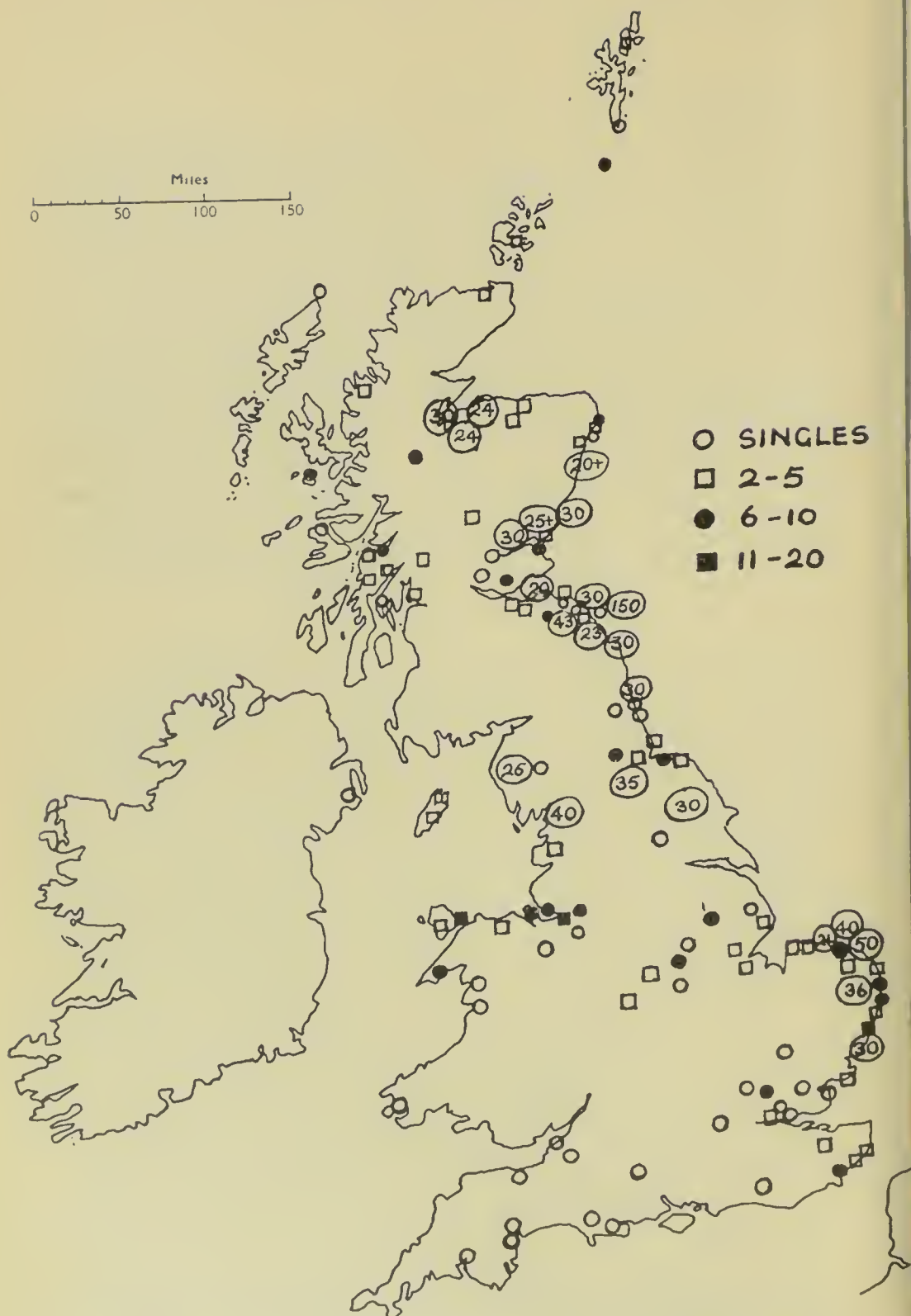


FIG. 5. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, November 1957

WAXWING INVASIONS DURING 1956-60

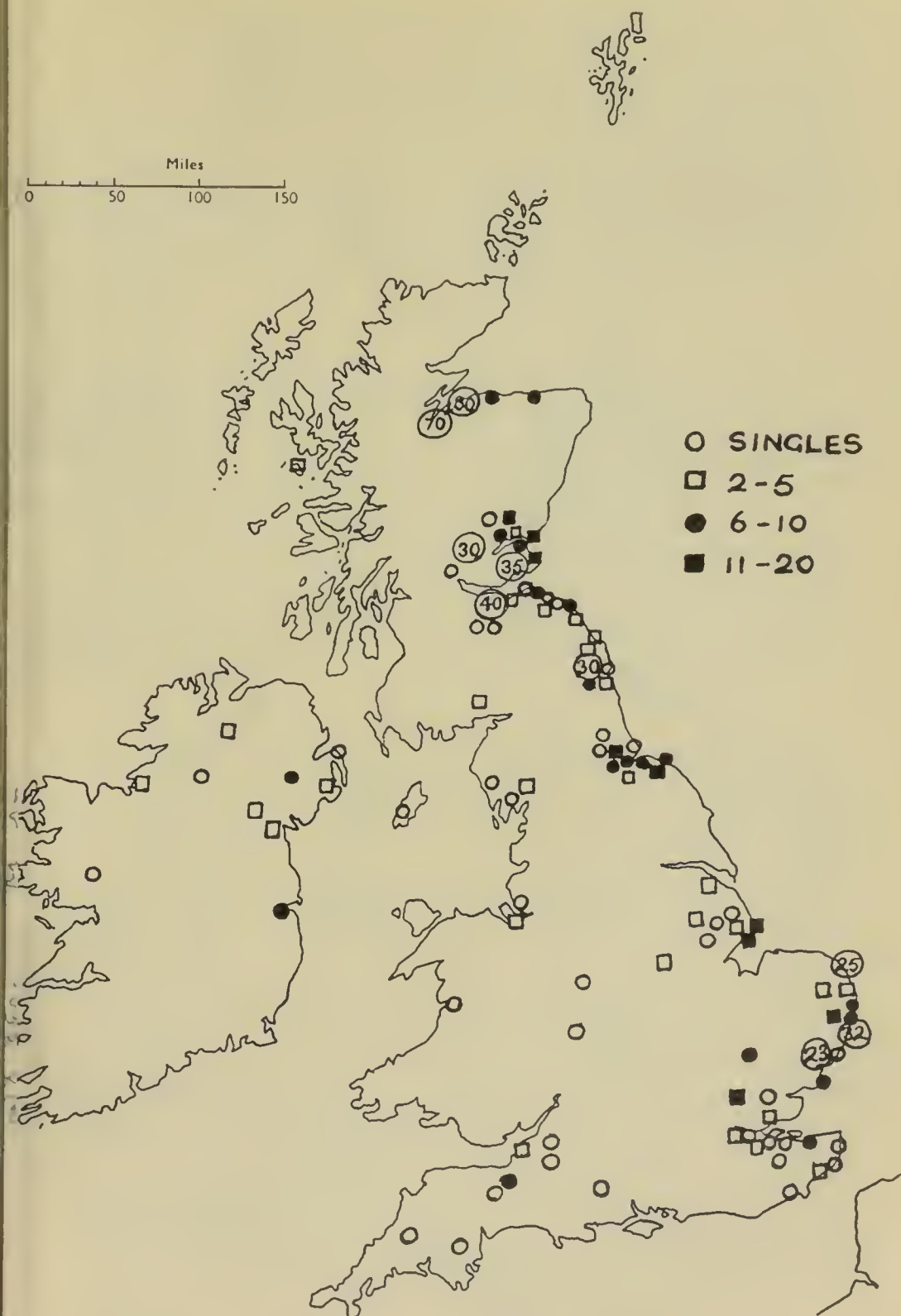


FIG. 6. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, December 1957



FIG. 7. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, January-March 1958

inland England and small parties were reported from the northern half of Ireland during the second half of the month (Fig. 6).

By the middle of January the numbers of Waxwings in Britain were very greatly reduced and the main east coast concentrations had broken up. That some of the birds had moved west is shown by the number of records from Ireland, particularly a sizeable concentration in the Dublin area; but they were becoming scarcer in inland England, there were virtually none left in Scotland, and the majority had, no doubt, returned to the Continent. Thereafter only scattered stragglers were reported, the majority in East Anglia (Fig. 7).

1958-59

The 1958 breeding season

In the spring of 1958 return migration was again noted inland in Sweden, especially at Kumla (nearly 100 miles west of Stockholm), and on a large scale on Gotland, between the third week in March and the end of April. Although there were a considerable number of observations of Waxwings during the breeding-season well to the south of the normal breeding range, these were fewer than in 1957 and the area of main density was much further north, beyond the Arctic Circle to the north of the head of the Gulf of Bothnia. Breeding was thus reverting to the normal range, though still above average in intensity in its more westerly parts (L. Wallin *in litt.*).

The progress of the invasion in autumn 1958

By 1958 the rowan trees had recovered their vigour and in the autumn of that year there was an abundant crop of berries in many parts of Fenno-Scandia. These berries, however, attracted large flocks of Fieldfares (*Turdus pilaris*), so that by the time the Waxwing flocks arrived in Sweden the food supply had become somewhat depleted, with the result that the birds appeared only for a short time in the eastern parts of central Sweden.

Two separate invasions appear to have occurred. The earlier and by far the larger came from the east. Early in the autumn big flocks had gathered in southern Finland and Esthonia. In the last week of October these began to move and large-scale passage was recorded on Gotland. These birds passed rapidly westwards into southern Sweden where numbers built up until by mid-November concentrations of between 2,000 and 4,000 were recorded in a number of localities. These big concentrations, it would seem, soon exhausted the berry supply and by the first week in December the numbers in southern Sweden started to drop sharply. The flocks were on the move again and this was soon demonstrated by the appearance of the birds in Britain and of at least one party in Ireland.

In mid-November a second invasion started, but it was on a smaller

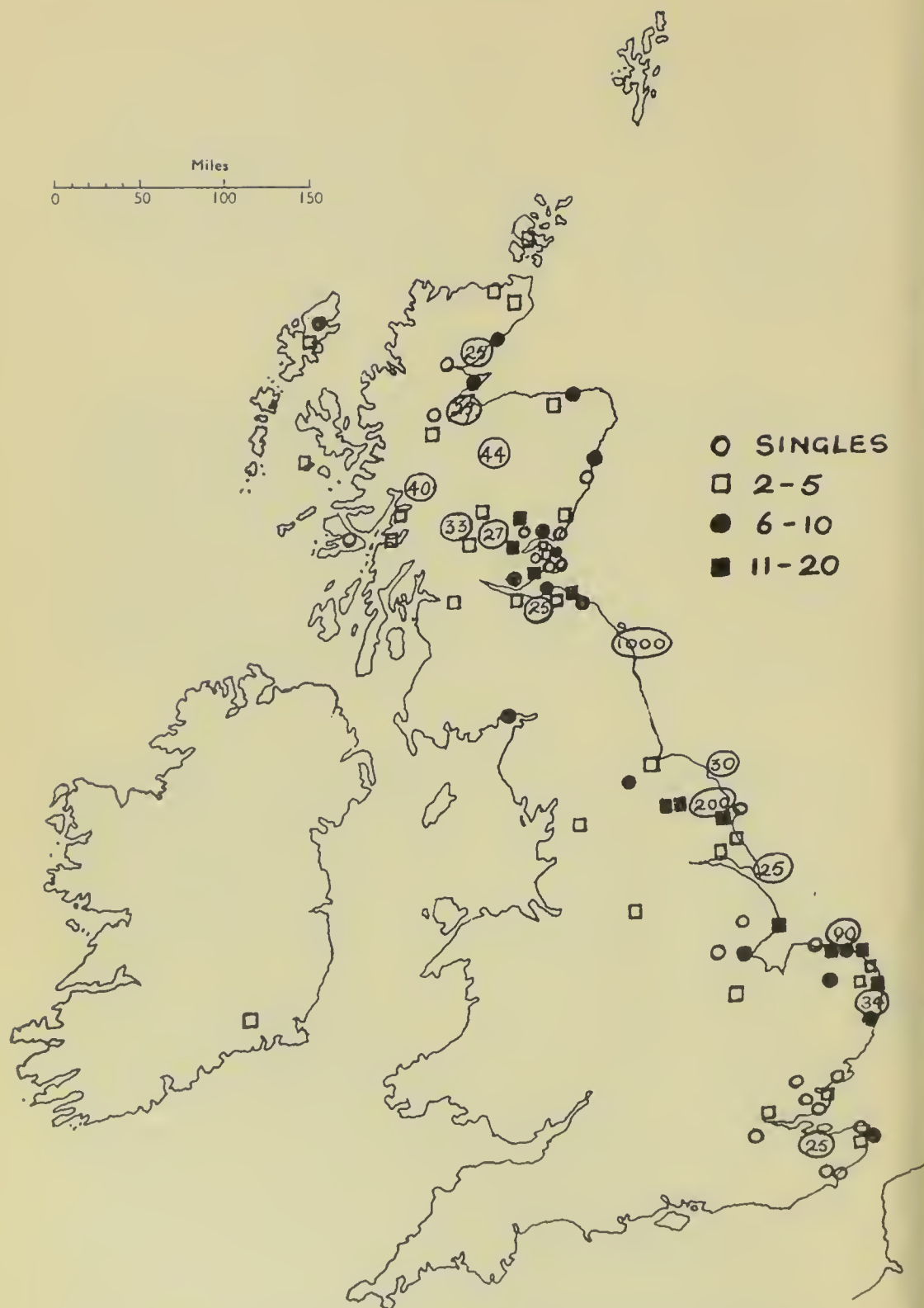


FIG. 8. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, December 1958

scale and from a different direction. Up to this time few Waxwings had been recorded in central and northern Sweden, but now concentrations of up to 200 birds appeared in these areas. The southward movement was relatively slow since, presumably, these rather modest numbers bore less hardly on the food supply. It would seem that these birds came not from the east but from the northern parts of Sweden and Finland. As they moved southward their movement was marked by small secondary peaks of numbers in southern Sweden in mid-December but, since the berry supply had been exhausted by the earlier hordes, these were short-lived and they passed on in the wake of the main body (L. Wallin *in litt.*).

There was an interesting ringing result at this time. A Waxwing that had been marked at Pegswood in Northumberland on 9th March 1957 was recovered about 15th December 1958 at Ovre Grorud in the area of Oslo, Norway (*Brit. Birds*, 52: 463).

The invasion in Britain and Ireland from December 1958 to March 1959

It is common experience that the arrival of an immigration species is often preceded by a scatter of early fore-runners of the main movement. This was true of this third successive immigration of Waxwings into Britain, the earliest bird of all being reported from Nairn on 23rd October. During November there was a small number of reports also from the Moray Firth area and from Fair Isle, one from Fife and a few from East Anglia. But the main invasion did not start until about 13th-15th December. To begin with, numbers were small, but they were scattered all down the east coast from Orkney to Kent. There was also a scattering of reports from western Scotland (Lewis, Isle of Mull, Glasgow, Skye and Glen Nevis). Similar early westerly occurrences were noted by Baxter and Rintoul (1937, 1947) for the invasions of 1921, 1937 and 1946 and were also reported in that of autumn 1957 (see above). Thereafter, numbers built up slowly, but flocks of over twenty birds were exceptional, thirty at Rannoch (Perthshire) on the 18th being the largest noted. Immediately after Christmas, however, a most spectacular immigration into north-east Northumberland was reported. Some 65-70 arrived on the 26th, and on the 27th many flocks of 30-50 (totalling at least 500) were watched coming in from the coast. For the next week every berry-bearing hedge in this area had its quota of Waxwings and there must have been at least 1,000 birds in the district. Although this was by far the biggest concentration, the same movement was also recorded further south in the East Riding of Yorkshire (25 flew south at Spurn on the 27th and there were 200 at Ayton on the 28th), on the north Norfolk coast and in east Kent. And during the following week larger parties than previously were reported from the Scottish Highlands (Fig. 8).

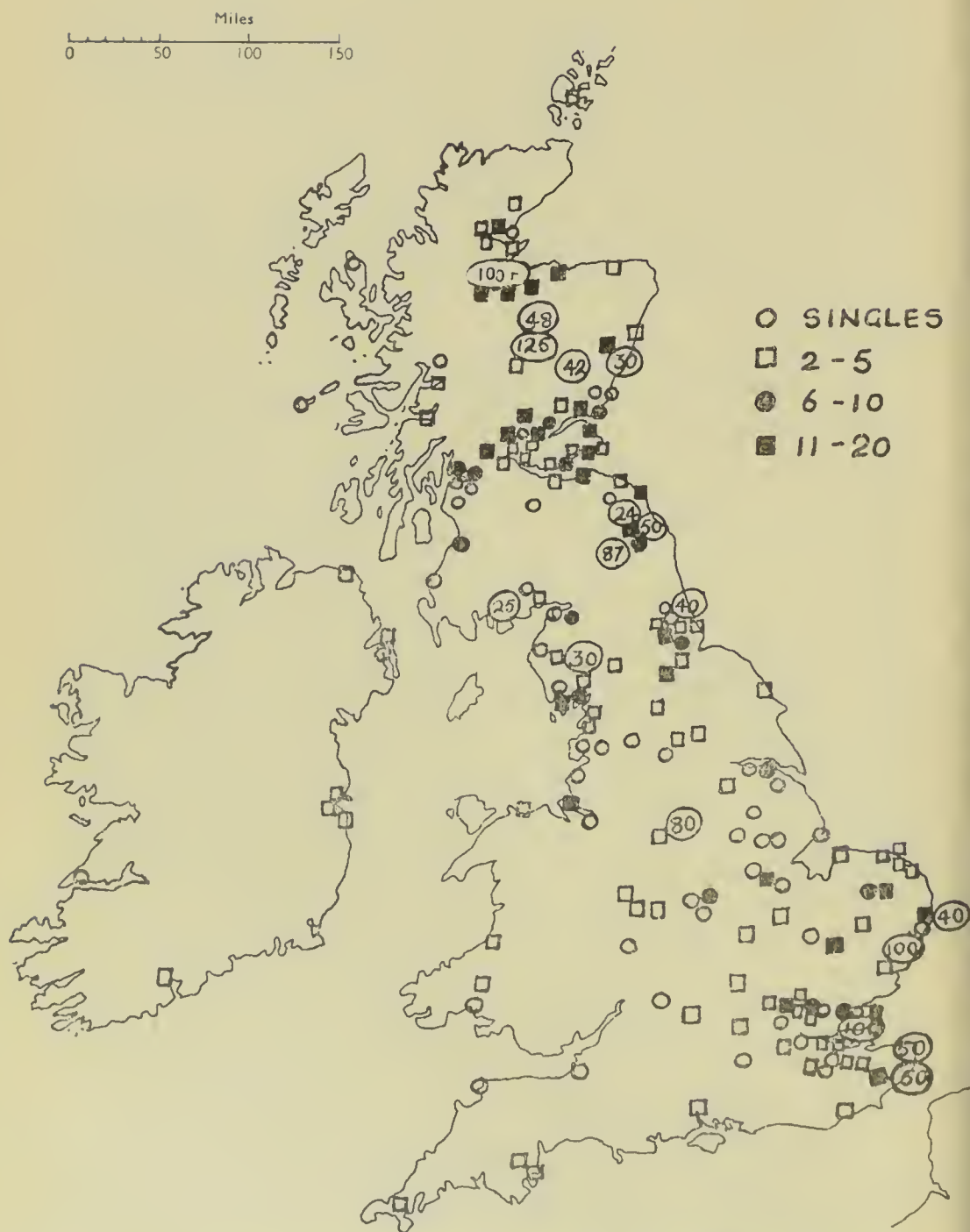


FIG. 9. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, January 1959

WAXWING INVASIONS DURING 1956-60

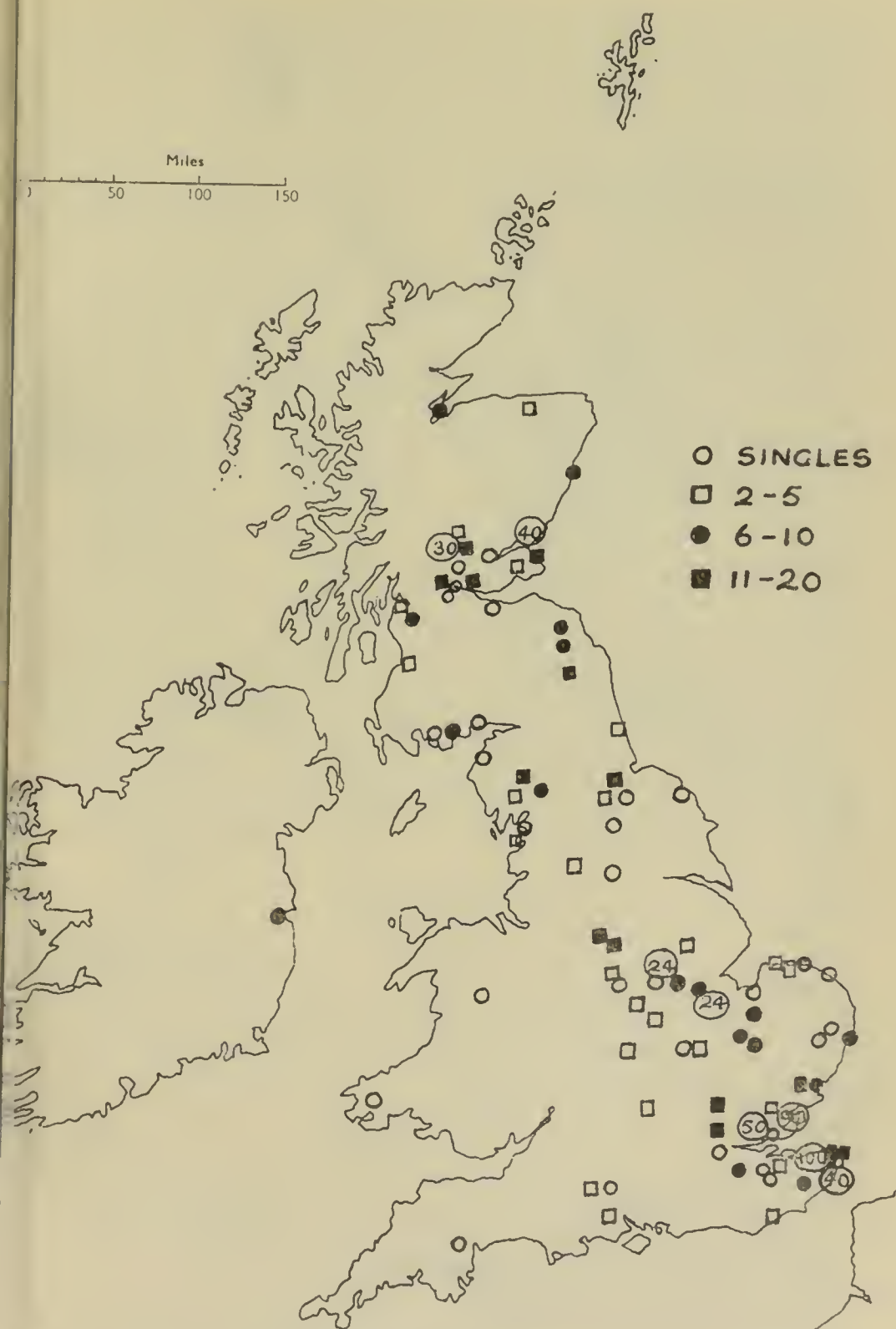


FIG. 10. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, February 1959

BRITISH BIRDS

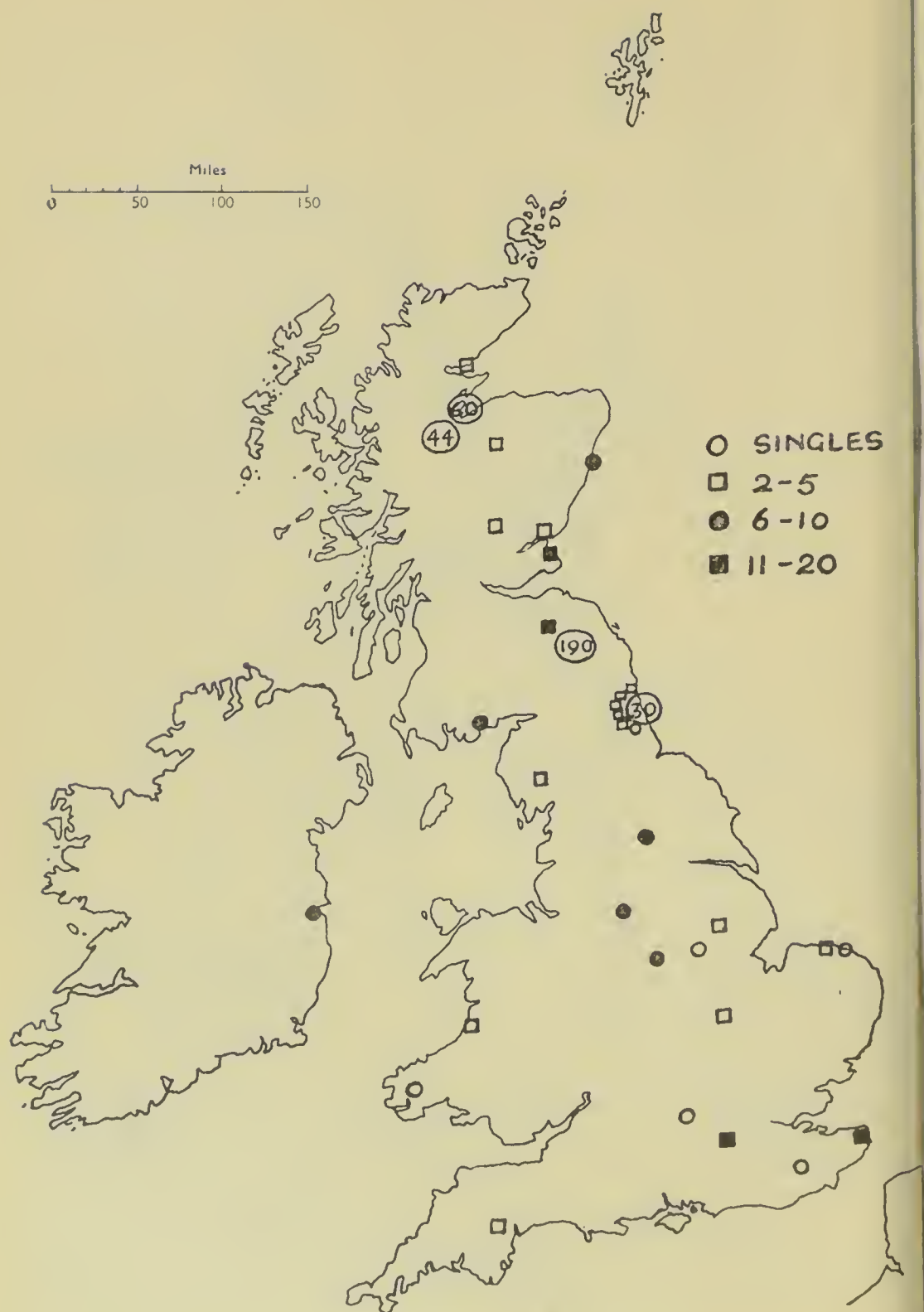


FIG. 11. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, March 1959

During January Waxwings were reported, often in flocks of considerable size, at a large number of localities over almost the whole of Scotland and England and there were smaller numbers of records from Wales and Ireland. Main concentrations were in the Moray Firth area, in the Scottish Highlands, all round the Firth of Forth, in Northumberland and in Suffolk, Essex and east Kent. The pattern of increases and decreases is so confused that it is difficult to be sure what was happening, but it seems likely that the flocks were moving about the country in search of food rather than that there were any substantial new arrivals from the Continent (Fig. 9).

During February the number of birds reported had considerably decreased although records still came from widely scattered places. The flocks were usually of smaller size. This decrease was especially marked in northern Scotland and in eastern coastal areas except around the Thames estuary (Fig. 10). This may indicate exhaustion of the berry supplies in these areas and consequent dispersal in search of food.

By March the birds had largely disappeared, although there was a small number of concentrations of considerable size, especially in the north; and in certain places (where, presumably, food was still available) some birds remained until about mid-April (Fig. 11). These late-season concentrations are interesting and may possibly indicate gathering for emigration. A notable flock of 60 at Avoch (Ross) on 1st March showed great restlessness, vigorous flight alternating with periods of gliding as they circled a field before returning to the tree they had just left. This kind of restless behaviour is certainly suggestive of a migratory impulse.

The Scottish records for the 1958-59 invasion have been summarised by Macmillan (1959).

1959-60

The 1959 breeding season

Return migration in spring was again noted in Sweden, but on a smaller scale than in the previous two years. Breeding was not noted in central or southern Scandinavia, but occurred on the north Swedish coast which is considerably beyond the normal range (L. Wallin *in litt.*).

The progress of the invasion in autumn 1959

The rowan berry crop in the autumn was rather poor in Scandinavia. Despite this fact, flocks of up to 100 or 200 Waxwings could be seen in Uppsala during the whole of October. By the end of the month, however, the food was exhausted and the birds moved on (L. Wallin *in litt.*). A bird ringed near Kalix (at the head of the Gulf of Bothnia) on 8th October was found dead at Kirkcaldy (Fife) six weeks later, on 19th November (*Brit. Birds*, 53: 511).

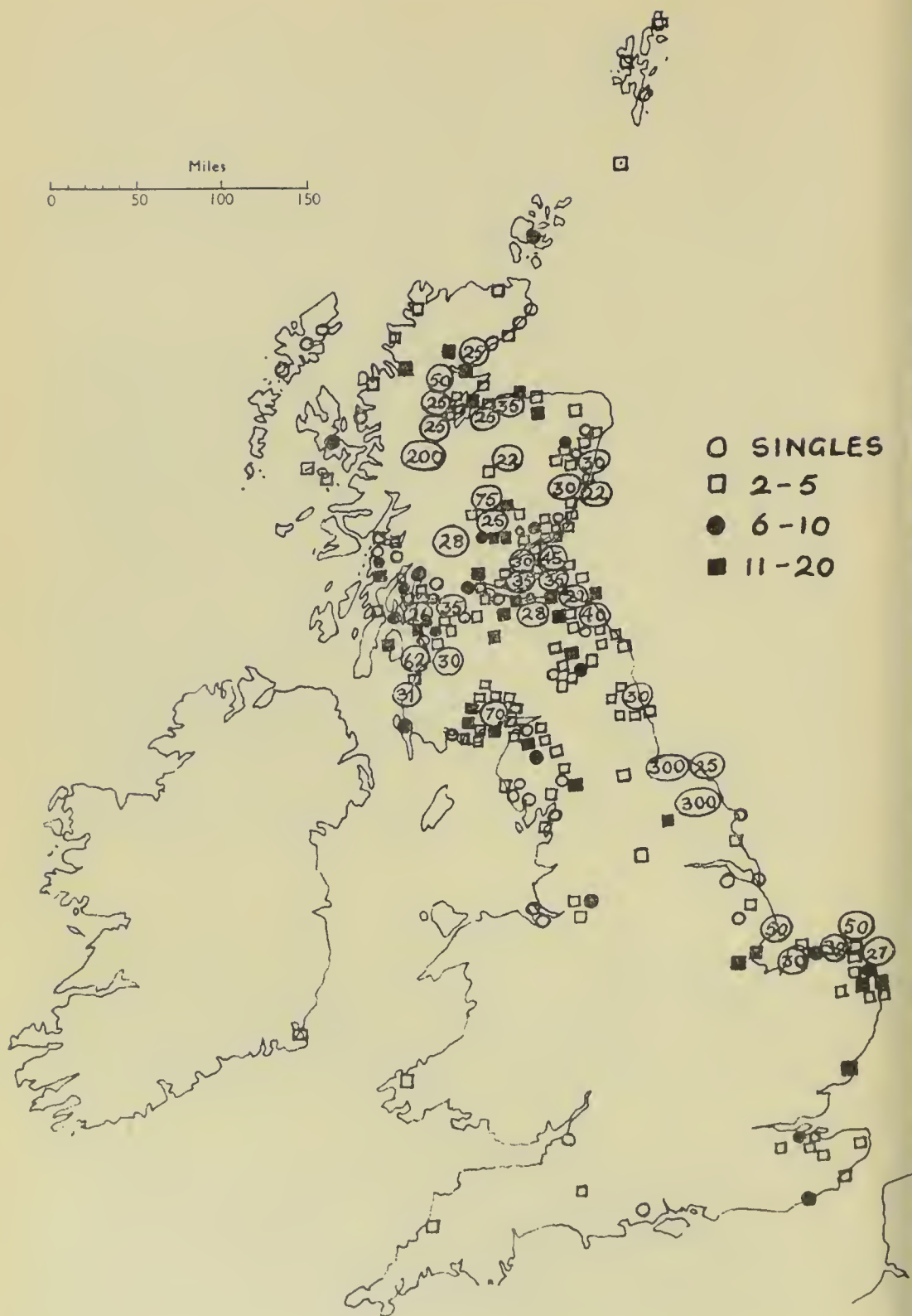


FIG. 12. Waxwings (*Bombycilla garrulus*) in Britain and Ireland, October-November 1959

WAXWING INVASIONS DURING 1956-60

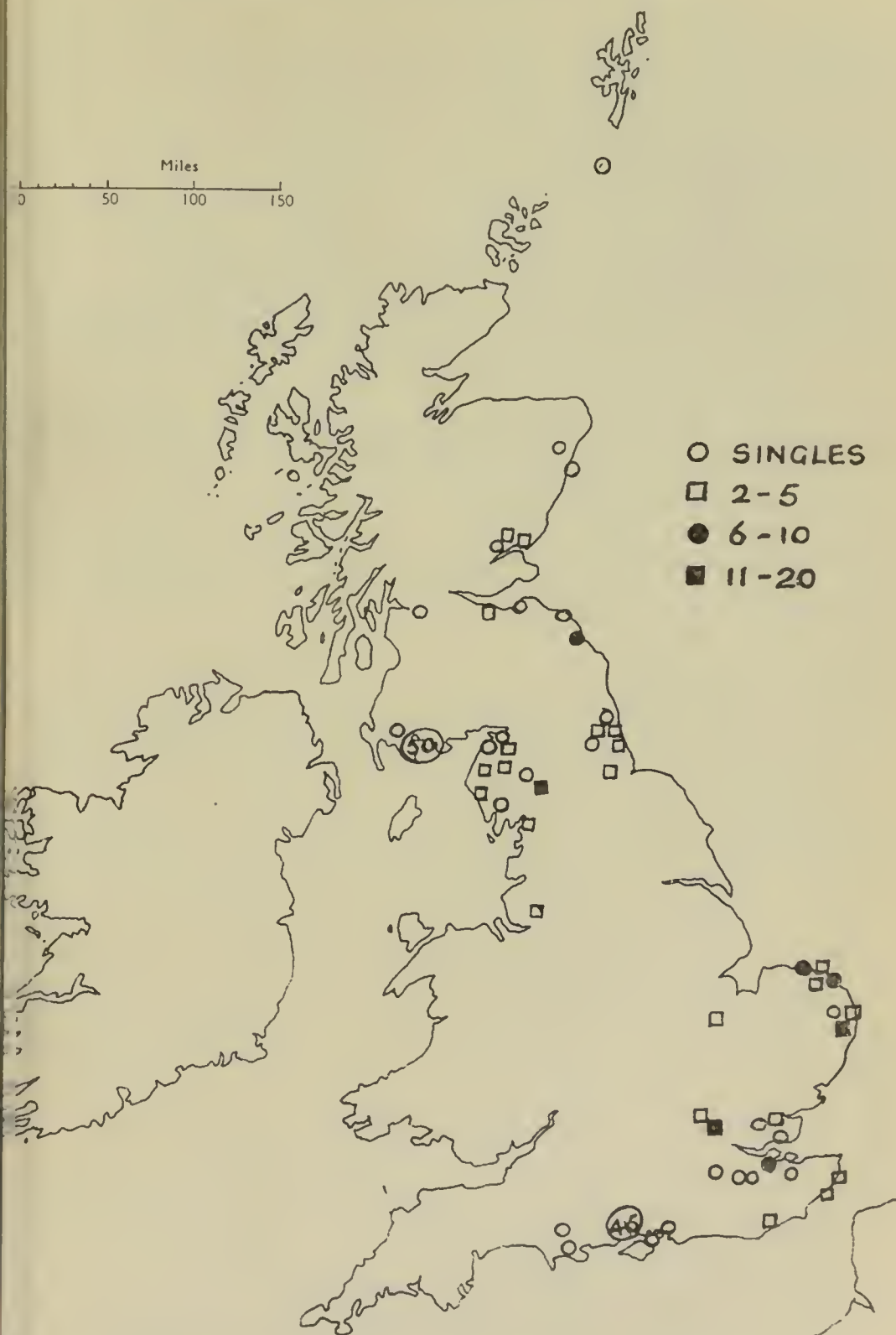


FIG. 13. Waxwings (*Bombycilla garrulus*) in Britain, December 1959-March 1960

TABLE 1—SUMMARY OF RECORDED SOUTHWARD INVASIONS OF WAXWINGS
(*Bombycilla garrulus*) IN EUROPE BETWEEN 1679 AND 1960

The years up to 1900 are those listed by Fisher (1955) as ones in which there was a "southward European" invasion, and italics are used whenever Britain or Ireland are known to have been affected. The columns for Hungary and East Prussia, 1900-1940 only, are from Lack (1954)

Southward European invasions before 1900

1679-80	1787-88	1803	1822	1834-35	1854-55	1870
1685-86	1788-89	1810	1828-29	1841	1863-64	1872-73
1702-03	1790-91	1820	1830-31	1849-50	1866-67	1892-93

Invasions of Hungary, East Prussia and Britain and Ireland after 1900

Hungary	Prussia	Britain or Ireland with notes on months and distributions				
1903	1903	1903-04	October-December onwards; Scotland, East Anglia and notably Ireland (BB, 1: 148; 2: 410)			
1905						
1910	(1910)					
1913	1913	1913-14	(November) December-February (April); England and Scotland, also Ireland and Wales (BB, 7: 263, 292, 319, 344; 8: 15, 49, 127; 9: 159)			
	1918					
1920						
1921	1921	1921-22	(September) November-January (February); England, also Scotland and Wales (BB, 15: 155, 187, 208, 239, 269, 285, 295; 16: 11)			
1923	1923					
1925						
1927						
1929						
1931	1931	1931-32	(October) November-January (March); England, also Scotland, odd ones Wales and Ireland (BB, 25: 223, 269, 303, 333, 347)			
1932	1932	1932-33	November-December (January); mainly eastern England, also Scotland and Ireland (BB, 26: 259, 277, 313)			
	1935					
1937	1937	1937	February-March (April); Scotland and extreme north of England, few other parts England; hard weather in Scandinavia; food scarce, many died (BB 31: 56, 86, 157)			
		1941-42	November-December (February); Scotland and eastern England, later few other parts England (BB, 35: 157, 180, 231, 254, 27)			
		1943-44	(October) November-January (April-May); England, also Scotland (but hundreds at Fair Isle in October) (BB, 37: 196, 213; 38: 315, 344, 300; 39: 94)			
		1946-47	(August-October) November-February (May); Scotland and England, also Wales and Ireland; largest on record (BB, 41: 2, 34)			
		1948-49	(December) January-March (April); mainly eastern England, few other parts Scotland (BB, 43: 151, 309)			
		1949-50	(October) November-January (April); England, fewer Scotland, also Ireland and Wales (BB, 44: 158, 418)			
		1957	(January) February-March (April); eastern England and Scotland, few other parts (pages 4-8)			
		1957-58	November-January (March); Scotland and England, and Wales and Ireland (pages 9-13)			
		1958-59	(October) December-February (April); Scotland and England, also Wales and Ireland (pages 14-19)			
		1959-60	(August) October-November (April); Scotland and north and east of England, odd ones other parts England and Wales (pages 20-23)			

No records available

No records available

The invasion in Britain and Ireland from October 1959 to March 1960

Once again there was a small number of reports of precursors of the main invasion—a single bird in Kirkwall (Orkney) from the end of August, a number in Unst (Shetland) during September and October, a few at Pitlochry (Perthshire) from 22nd October, and reports about this time from Thurso (Caithness), Banchory and Glassel (Kincardine).

But it was not until 30th October that the main invasion began. On that and the two following days birds were recorded all down the east coast of Scotland and even in the Western Highlands, Skye, Bute and Ayrshire. At the same time records came from Northumberland, Cumberland, East Yorkshire, Lincolnshire and Norfolk. Numbers built up rapidly during the following week, but large concentrations were unusual although reports of small flocks were thickly scattered. The only really sizeable flock reported in Scotland was one of over 200 birds at Fort Augustus (Inverness) about 18th November and there were some 300 at Teesmouth by mid-November and on Carlin How (Yorkshire) on 15th November. During November there was some westward spread in northern Britain (especially from 21st November in south-west Scotland), but reports from southern and western England, Wales and Ireland were extremely scarce (Fig. 12).

As in Scandinavia, the berry crop in Britain was a poor one. The invasion was therefore much shorter-lived than in the previous three winters. By the last week in November numbers were already falling and after the end of the month records became scarce. Small numbers were still occasionally reported in January, February and March, but there were only two records of flocks of any size. These were both on 13th January when 50 were at Cardoness near Gatehouse of Fleet (Kirkcudbright) and 45 flew in from the Solent at Titchfield Haven (Hampshire). A strong hard-weather movement was taking place at this time (Williamson and Ferguson-Lees 1960).

Since some observers do not send in reports until the end of the calendar year, further records for 1960 may still come to hand. It seems improbable, however, that these will alter the general picture. The Scottish records for the 1959-60 invasion have been listed in detail by Macmillan (1960).

PART 2—DISCUSSION

The frequency of Waxwing invasions

Never before have large-scale Waxwing invasions been recorded in Britain in four successive winters. But to evaluate this properly one must consider how often invasions are recorded over the whole of the bird's range. Table 1 sets out the chief ones noted in western and southern Europe in the last three hundred years. The earlier records are doubtless very incomplete, but in the first fifty years of the twentieth

century invasions have been noted in twenty-two years. Moreover, similar invasions have been noted further east in the Balkan countries, southern Russia, Turkey and Persia. There is not sufficient evidence to show whether invasions with a westward trend are more or less frequent than those in other directions. But Lack (1954), quoting Rydzewski, cites a most interesting example of a Waxwing that was ringed in Poland in February 1937 and recovered in the following winter (when no invasion was noted in western Europe) 3,000 miles further east, in Siberia. This suggests a bird without any directional preference and the probability is that movement out of the breeding areas takes place every year in random directions on a greater or lesser scale. Britain and Ireland are on the far westward fringe of the species' range, so, of necessity, we only occasionally see a little of what is, in fact, an annual event.

The biological function of invasion migration

If animals are to inhabit those parts of the world that have seasons during which they cannot live their normal lives, they must devise some means of passing these seasons in safety. Different animals do this in different ways. Some mammals and insects hibernate; other insects pass the danger season as eggs or pupae. But birds, with their pre-eminent powers of flight, solve this problem by flying to places where conditions are easier. In different parts of the world temperatures or lack of water may make the season inhospitable, but for most birds the problem is food. Insect-food may be absent altogether; the ground may be frozen too hard for probing bills or the water may be covered by ice; snow may have buried the seeds and low-growing berries.

The chief winter food of the Waxwing is the berries of the rowan (*Sorbus aucuparia*), an abundant tree in northern Europe where it is found both wild and lining the avenues in towns. Only when rowan berries are not available does the Waxwing turn to different foods. These are principally the berries of other trees and shrubs (frequently *Cotoneaster*, juniper, *Pyracantha*, hips and haws), but even bread, tallow, coarse oatmeal and seeds offered on bird-tables will be eaten on occasion, and whole apples may be devoured. In the spring, when the snow-cover melts, low-growing berries such as bilberry (*Vaccinium*) and crowberry (*Empetrum*) become available as important foods. Insects are taken plentifully during the breeding season.

The crop of rowan berries varies widely from year to year. This is largely due to variations in weather at the time the rowans flower, warm weather at that season causing a heavy crop. Moreover, as Svärdson (1957) has shown, a heavy crop is invariably followed by a light one because of "tiredness" in the trees. This sequence is well known to growers of tree-fruits. Svärdson has also suggested (*in*



PLATE I. Above, Waxwing (*Bombycilla garrulus*) feeding on fallen apples, Norfolk, February 1957. Below left, resting among guelder rose berries, another main food; below right, perched by the remains of an apple $2\frac{1}{2}$ inches in diameter which was eaten in four short visits (pages 39-40) (photos: R. P. Bagnall-Oakeley)





PLATES 2 (above) and 3 (right). Studies of a party of seven Waxwings (*Bombycilla garrulus*) feeding tamely on *Cotoneaster* berries on a roadside cottage, Norfolk, February 1957. They stripped 100 square feet of berries in only two days. Another Waxwing ate some 390 berries (roughly the equivalent of its own weight) in 2½ hours (page 40). Note the crest, black eye-patch and bib, short yellow-tipped tail and prominent white and yellow wing-markings (photos: R. P. Bagnall-Oakeley)





PLATE 4. Above, Waxwing (*Bombycilla garrulus*) on nest, Sweden, 1956; nests are usually in conifers and built of pine and spruce twigs, also reindeer moss and other lichens (photo: G. Hansson). Below, Waxwing drinking at a puddle formed by the drainage from a manure heap, Norfolk (photo: R. P. Bagnall-Oakeley)





PLATE 5. Female Grey-rumped Sandpiper (*Tringa brevipes*), Rybnaya River, Siberia, July 1959. Nearly Redshank-sized but with shorter legs, this species is uniform dark grey above except for light feather edges. In summer the throat and breast bear wavy bars of a similar grey, while the belly and under-tail are white (page 30). The legs and a patch at the base of the blackish bill are dull yellow. Like other *Tringa*, it perches on trees in the nesting area (photo: A. V. Krechmar)

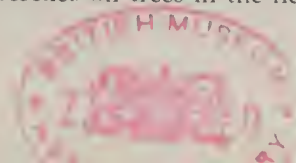




PLATE 6. Above, female Grey-rumped Sandpiper (*Tringa brevipes*), showing the grey barring on the white under-parts, Rybnaya River, July 1959 (photo: A. V. Krechmar). Below, the only nest ever found (page 32)—four eggs in a grass-lined hollow among stones, Makus River, Siberia, 19th July 1959 (photo: J. Y. Livshits). Inset, a downy nestling roughly two days old (page 32) (photo: A. V. Krechmar)

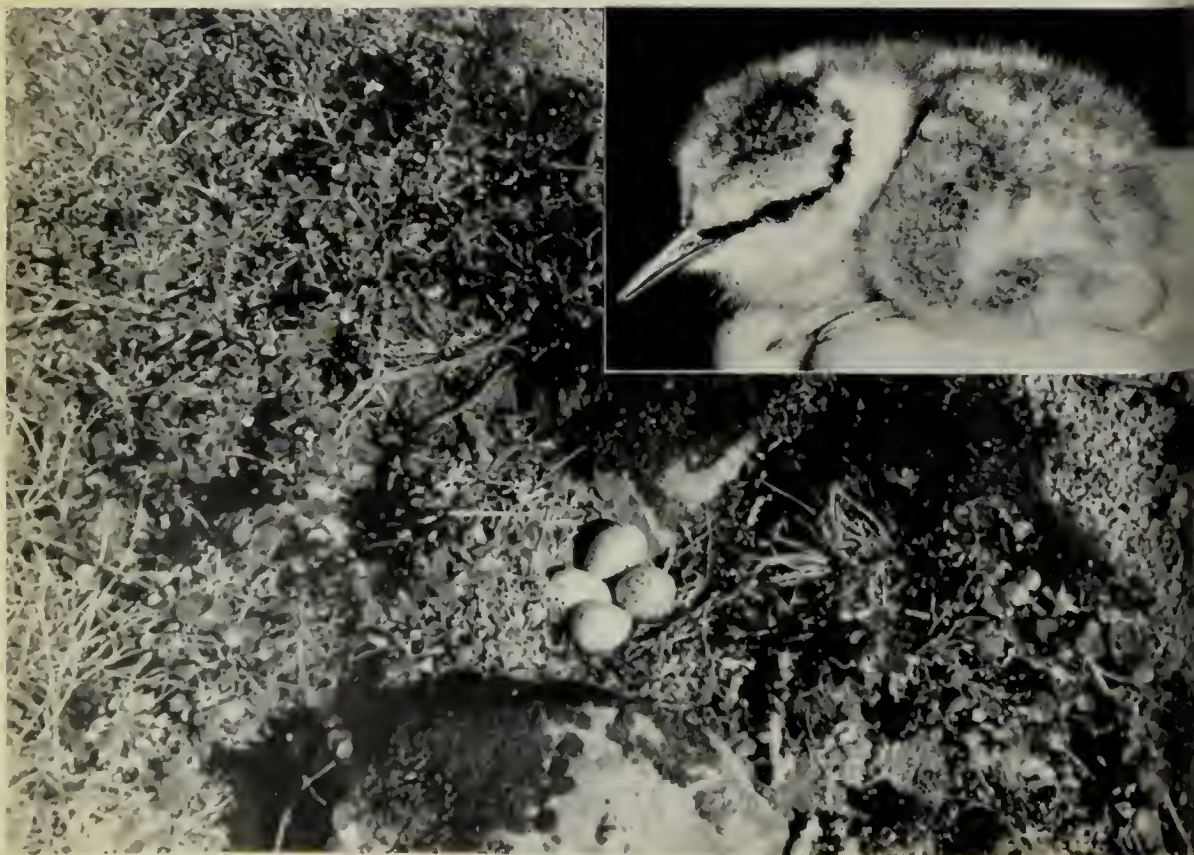




PLATE 7. Breeding habitats of Grey-rumped Sandpipers (*Tringa brevipes*), Rybnaya River, July 1959. This species nests near the tree-line in the mountains of north-east Siberia at altitudes from under 500 to over 6,000 feet (page 31). It is characteristically found along river banks, but occasionally some distance from water in sparse forests of stunted trees (page 33) (photos: A. V. Krechmar)





PLATE 8. Above, pair of Grey-rumped Sandpipers (*Tringa brevipes*) brooding young, Rybnaya River, July 1959. Below, female with chick creeping under her right wing. Both sexes brood the young, but the females do so more readily. The chicks are reared among the sedges and dwarf willows of marshy river edges where they feed on the hordes of gnats and mosquitoes (page 32) (photos: A. V. Krechmar)



litt.) that the low-growing berries tend to fluctuate in the same cycle as the rowans so that, when the birds find a good supply of rowans, they also find a good supply of their spring food even though it is at that time hidden by the snow. They may have to move on when the rowan berries are exhausted, but know where to return to in spring. Very occasionally, as in the winter of 1932-33, the ground is sufficiently free of snow for the low-growing berries to provide food even in winter. This variation in the rowan berry crop is not, of course, necessarily uniform over the whole of the birds' range, although, since it depends largely on the weather at the time the trees flower, there tends to be an equally heavy or light crop over a wide area.

In the years under review rowan berries in northern Europe were extremely abundant in the winter of 1956-57; extremely scarce in 1957-58; moderately numerous in 1958-59; moderately scarce in 1959-60; and again exceedingly abundant in the autumn of 1960. In the winter of 1956-57 it was not until February 1957, when they had exhausted even the abundant crop in Scandinavia, that the Waxwings spilled over into Britain and the Low Countries. This invasion was largely confined to eastern Britain. In the autumn of 1957, by contrast, the Waxwings passed rapidly through Scandinavia, finding no rowan berries to detain them, and reached Britain by the first week in November, later spreading out over the whole country and even reaching Ireland. In 1958 the moderately abundant Scandinavian crop was attacked by Fieldfares before the Waxwings arrived, so that by late December it had failed and the birds moved on to Britain, again spreading over the country and extending to Ireland. In 1959 the pattern of 1957 was repeated, berries again being scarce in Scandinavia, and the birds reached Britain early—from 30th October onwards. The British berry crop, however, was not very abundant in this year and could not support many birds after the end of November. On the score of the very abundant crop in the autumn of 1960, G. Svårdson (*in litt.*) has predicted scarcity of food supply in the autumn of 1961 and consequent large-scale emigration from Scandinavia. It will be interesting to see whether this forecast proves to be as accurate as the similar one he based on the expected scarcity of 1957 (Svårdson 1957).

Complementary to the rowan berries in determining the pressure on the food supply is, of course, the level of the Waxwing population. As already stated, a heavy berry crop is primarily caused by warm weather at the time the rowans flower. This good weather is also conducive to a high survival rate among young Waxwings during the breeding season and the subsequent heavy crop of berries also helps above-average survival among the birds during the following winter. In this way the population-level builds up rather rapidly. Since, however, a poor berry crop invariably follows a heavy one, it is in

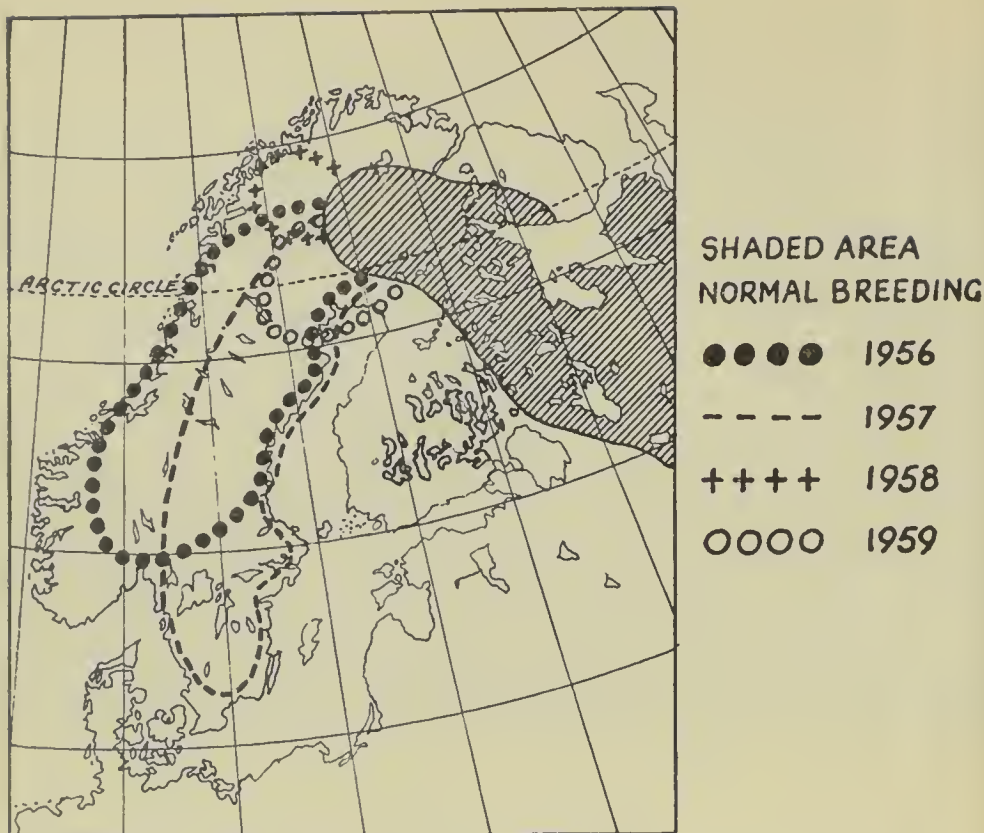


FIG. 14. Extensions of the breeding range of the Waxwing (*Bombycilla garrulus*) in Fenno-Scandia in 1956, 1957, 1958 and 1959

the autumn following a heavy crop that the peak pressure on food supply occurs. Population is high; berries are scarce; the birds must move or starve. In some winters, indeed, they fail to find food and do starve in large numbers, as was noted by Baxter and Rintoul (1937) when many died on reaching Britain in February and March 1937, following severe weather in Scandinavia. When this happens, the population may decline as sharply as it rose previously and it is interesting to note (see Table 1) that following the 1937 winter no further invasion was recorded in western Europe until 1941-42. It seems possible that the poor berry crop in the 1959-60 winter may have caused a similar heavy mortality and it may be that this will bring the present series of invasions to an end.

When the population is at a high level there is usually an extension of breeding beyond the normal range. This may be caused by an overflow in spring, the birds moving out at that season from the overcrowded breeding areas. Or, more commonly, some of them stay behind in the wintering areas and nest there. It has proved impossible to obtain direct evidence of the level of population in the main breeding areas during the years under review, but the extent of the breeding

range gives a strong indication that the level remained high throughout the four years (see Fig. 14). In the spring of 1956 there was evidence that an overflow of breeding birds into the Scandinavian peninsula took place. In 1957 many Waxwings from the great flocks of the previous winter remained behind to nest over almost the whole of Sweden. In 1958, following the poor berry crop, extra-limital breeding was reduced but nevertheless above average, the main centre being to the north of the Arctic Circle. In 1959 the limit of the breeding range had retreated still further, but nesting in the north Swedish coastal areas was still beyond the normal area. This continued high level of population is, indeed, the probable explanation of the unprecedented series of four large-scale invasions of Britain which, being on the extreme western edge of the birds' range, are invaded only when pressure on the food supply in Europe is very great.

G. Svårdson (*in litt.*) states that study of the Swedish nesting records (which are, of course, beyond the normal breeding range) shows that they tend to occur in short sequences of two or three years and that the first of these years tends to be the richest. This conforms fairly well with the events of 1956-59 except that in these years the sequence was unusually prolonged and the peak year was the second one, 1957, following the big invasion in the year of abundance. Probably the extension in range in 1956 by overflow in the spring was unusual.

To sum up, the Waxwing depends mainly on a winter food of which the supply varies widely in different years. True migration—the annual movement from a breeding area which is inhospitable at some season to a kinder area—is an adaptation to a variation in conditions, usually food supply, that occurs annually. Sedentary habits are an adaptation to conditions that are reasonably stable throughout the year. The invasion type of migration is an adaptation to conditions that fluctuate not annually but irregularly.

The proximal causes of the invasion type of migration

Lack (1954) has suggested that the hypothesis which best fits the known facts of invasions is that big emigrations are stimulated proximally by high numbers as such, crowding producing unusual restlessness and excitement culminating in emigration in advance of failure of the food supply. This, he suggests, is a useful adaptation resulting in early dispersal before the high population exhausts the food supply and allowing the birds to set out before they become weakened by starvation. In seasons when population is at a lower level this stimulation is absent and emigration is a direct response to failing food supply. Svårdson (1957) has been somewhat critical of this view, suggesting that the proximate factors that stimulate invasion migration are just the same as those that stimulate true migration and that the birds

start to move every autumn, the difference between the two types of migrants coming when they encounter abundant food, invasion migration then being inhibited and true migration unaffected. To the present author these views do not seem to be irreconcilable. It seems reasonable to suppose that Svårdson is right and the internal physiological state of the birds and the immediate environmental conditions that cause the onset of true migration also operate for invasion migrants and, moreover, operate regardless of population level. But Lack may equally be right that, when population level is high, an additional proximal factor operates leading to early reinforcement of the migratory urge. In each of the years under review movements of Waxwings were recorded rather early in the season. As has been shown, there are indications that population was at a high level throughout these years, and this earliness tends to support Lack's view. In some species the big emigrations have been shown to be composed mainly of young birds. This has been found to be less true of Waxwings than of some other birds and in 1956-59 there is no evidence of an unusual proportion of young birds.

It seems that in many species of birds migration is a somewhat unstable form of behaviour. Lack (1944) in discussing the problem of partial migration has shown the delicate balance of genetic, internal physiological and external environmental factors that governs it. Nice (1937) has shown that the American Song Sparrow (*Melospiza melodia*), a partially migratory species, does not inherit migratory behaviour and individuals may migrate and remain sedentary in successive winters. Cramp, Pettet and Sharrock (1960) have associated the 1957 irruption of tits (*Parus* spp.), which do not normally show invasion migration behaviour, with high population following an unusually good survival rate during the preceding mild winter; and they have cited evidence of excitement in the birds, which may have been one factor in their readiness to enter homes and attack paper, etc. The summer of 1959 was unusually fine and dry in Britain. As Williamson and Spencer (1960) have shown, in the autumn of that year there were quite unusual numbers of foreign recoveries of British-bred Linnets (*Carduelis cannabina*) and Goldfinches (*C. carduelis*). Dry weather during the critical weeks from egg-laying to the free-flying stage is likely to lead to above-average survival of the young and so to a high level of population. It is tempting to suggest that here is an example of invasion behaviour occurring quite suddenly in two species with which it is not usually associated and in response to an unusually high level of population. In the autumn of 1959, too, irruptions of tits were again noted in Britain probably as a result of similar breeding success in the fine summer (S. Cramp *in litt.*).

There seems to be an almost infinite range of variability between the fully migratory species and those that show this form of behaviour

only very occasionally and in response to an unusual situation. Perhaps, however, it is not really so surprising that migrational behaviour of one sort or another should be more or less latent in birds, since their powers of flight must provide the most obvious solution to their food supply problems.

ACKNOWLEDGEMENTS

The great majority of the British and Irish records on which this survey is based have already appeared in regional bird reports and acknowledgement has been made there to the host of observers concerned. The author wishes to express his gratitude to all those who so contributed and in particular to the editors of local reports without whose work this paper could hardly have been prepared and who have so tirelessly and courteously answered his enquiries. To George Waterston and Andrew Macmillan he is especially grateful for their analyses of the Scottish records that they generously allowed him to use. To Göran Hansson and Lars Wallin he extends especial thanks; without their permission to draw unreservedly on their work and their kindness in answering his enquiries it would have been impossible to attempt to relate the course of the invasions in Britain to the main Continental developments. To Dr. Gunnar Svärdson he is most grateful not only for his invaluable paper on "The 'invasion' type of bird migration" (which should be read as a background to the present study) but also for information and comments on the series of invasions under review.

SUMMARY

(1) The invasions of Waxwings (*Bombycilla garrulus*) during the winters of 1956-57, 1957-58, 1958-59 and 1959-60 are described with special reference to the breeding season preceding each, their progress in Scandinavia and events in Britain and Ireland.

(2) The frequency of Waxwing invasions into western and southern Europe is considered.

(3) The biological function of invasion migration as an adaptation to irregularity in food supply is discussed. Variations in the crop of the berries of the rowan (*Sorbus aucuparia*) and their effect on the level of population and on the timing and extent of movements and breeding in the years under review are described.

(4) The proximal causes of the invasion type of migration are discussed, in particular the importance of high numbers as such.

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Studies of less familiar birds

110. Grey-rumped Sandpiper

By Irene Neufeldt, A. V. Krechmar and A. I. Ivanov

Photographs by A. V. Krechmar and J. Y. Livshits

(Plates 5-8)

VERY LITTLE IS KNOWN about the breeding biology of the Grey-rumped Sandpiper (*Tringa brevipes*)* because it inhabits the remotest and wildest mountains of north-eastern Siberia. During the last few years, however, observations have been made by A.V.K., V. I. Kapitonov, K. A. Vorobiev and A. P. Vaskovski, and the following account is based mainly on these. All references to Kamchatka, the Sea of Okhotsk and the Cherski range respectively concern the papers by Averin (1948), Vaskovski (1956) and Vorobiev (1959).

This wader is widely distributed in the mountains of north-eastern Siberia from the Putorana mountain plateau (Lake Keta, the Rybnaya and Khantaika Rivers, etc., at about 69°N, 90°E) in the west to the mountains of the Kamchatka peninsula and probably the Anadyr range in the east. Within these limits Grey-rumped Sandpipers have

*In *The Handbook* this bird is treated as a race of the Wandering Tattler (*Tringa incana*) of America and the two forms are still regarded as conspecific by N. A. Gladkov in *The Birds of the Soviet Union* (1951). However, as pointed out in *The Handbook*, many other authors have treated the two as separate species because of structural differences, the Wandering Tattler having a longer nasal groove and the backs of the tarsi scutellated instead of reticulated; in addition, its under tail-coverts are barred in summer like the breast, instead of uniformly white as in the

been found in a number of places—in the Kharaulakh mountains, east of the Lena River at about 69°-70°N, in the Verkhoyanski range near the source of the Yana and Adycha Rivers, in the Cherski range by the upper courses of the Indigirka River and, lastly, in the mountains along the watershed between the Kolyma River and the Sea of Okhotsk. There is nothing new that can be said about the southern limits of the breeding range and, as far as we know, the species nests south to the high mountains near Lake Baikal and in the south-eastern parts of the Sayan mountains near Lake Kosogol.

The vertical distribution of the Grey-rumped Sandpiper varies in accordance with the latitude. In the foot-hills of the Putorana mountain plateau, where the tree-line is rather low, A.V.K. met these birds from only 100 to 300 metres (about 325-1,000 feet) above sea level; and in the Kharaulakh mountains, also in the far north, V. I. Kapitonov found them at similar altitudes, from 200 to 600 metres (roughly 650-2,000 feet). On the other hand, according to Vorobiev (1959), the species is common in the Cherski range from 800 to 1,400 metres (roughly 2,600-4,600 feet) above sea level and to the north of Lake Baikal Stegmann (1936) recorded it from 1,500 to 1,800 metres (roughly 5,000-6,000 feet). It is now evident that the Grey-rumped Sandpiper is characteristically found along the banks of rivers and streams in subalpine and alpine zones, and that only a few pairs nest much below the tree line.

The main migration routes are along the eastern coasts of the Asiatic continent and only as rarities have Grey-rumped Sandpipers been recorded on passage in central parts of Siberia. The first spring arrivals appeared on the Kamchatka coast about 13th-15th May. On the shores of the Sea of Okhotsk, near Magodan, the main passage took place between 20th and 25th May, and in 12-15 days the spring migration was over there. Much further west, in the Kharaulakh mountains, the first Grey-rumped Sandpipers were recorded on 23rd May at a time when all the mountain streams were still covered with ice and there were only a very few spots free of snow where the birds could feed, but in three or four days enough of the snow and ice had melted for them to find feeding places on the river banks. In the Cherski range the first of these waders appeared on 31st May. It was the very beginning of spring in the mountains and the northern slopes were covered with snow while the river beds were still waterless, as in

present bird (plates 5 and 6a). In accordance with our normal practice, we are following the *Check-list of the Birds of Great Britain and Ireland* (1952) in treating them as distinct species. The information given in *The Handbook* on the breeding of the Grey-rumped Sandpiper (or Polynesian Tattler) is based entirely on observations on the Wandering Tattler and so the data given in this text supplement that, while it should be particularly noted that the nest shown on plate 6b is the only one of the Grey-rumped Sandpiper that has ever been found.—I. J. F. L.

winter. Then in a day the weather became much warmer, a lot more snow melted and the waders had a chance to search for food beside the now-flowing streams.

At the westernmost point of the range in the western foot-hills of the Putorana mountain plateau A.V.K. recorded the spring arrival on 31st May in 1958 and on 1st June in 1959. In each year there were only odd birds and a few pairs or small parties of three or four at first, but in about four days they became abundant. At first they kept to the very edge of the ice on the Rybnaya River because the thaw starts earlier there than on other rivers in that area. They searched for their food among the debris on the melting snow and ice, picking up the first spring insects (Apterygota) which were very easy to see on the white background. From the day of arrival the birds were beginning to display. Both their displays and their calls were very reminiscent of those of the Greenshank (*T. nebularia*) and like that species they often perched on dead branches (plate 5). Until about 20th June pairs could be seen every day at the same places, usually at the mouths of small tributaries of the Rybnaya River and along the Makus and Kamustyak Rivers (plate 7). After this date only solitary males were noted and it was presumed that the females were busy with incubation, but until mid-July A.V.K. found neither eggs nor young, nor did he see any pairs alarming. On 19th July 1959, however, the geologist J. Y. Livshits happened across the only nest of this bird that has ever been found (plate 6b). It was simply a hollow among stones lined with dead grasses and there were four eggs. The incubating female was very tame and the observer was able to approach to within the distance of his outstretched arm. The habitat was stony forest-tundra 320 metres (roughly 1,050 feet) above sea level near the source of the Makus River and approximately 80 kilometres WSW of Norilsk.

On 16th July, at the mouth of a small tributary of the Rybnaya River and about 100 metres above sea level, A.V.K. discovered his first brood of downy young; there were four of them and they were only one or two days old (one is shown in the inset on plate 6b). They were very lively and running about among sedge and willow scrub on the marshy ground beside the river. The mosquitoes were swarming in countless millions at that time and the chicks, like the adults, were picking them up from the grass and even catching them in the air. Only the female accompanied this brood; with loud notes of alarm she perched on top of a tree near-by (plate 6a) or, approaching very close to the intruder, tried to lead him away from her brood. Plate 8b shows the female brooding the young (one is just creeping under her right wing) after crouching with half-stretched wings and recalling her scattered brood with a sweet trill. On 18th July A.V.K. found four pairs of Grey-rumped Sandpipers alarming along a two-

kilometre stretch of the river and located two more broods of recently hatched nestlings among the willow scrub. In each case both parents were with the young and both brooded them (plate 8a), though the females did so more readily. On the next day in a similar habitat three older chicks were discovered and on the 25th he found another brood, this time accompanied only by the male, on the partly dry shingle bed of a mountain stream on the watershed of Lakes Keta and Khantaiskoe. On 31st July, by the Khantaika River, he found a young one that was still only a few days old, but a week later, on 7th and 9th August, he came across young that were able to fly quite well and between the 12th and 19th the numbers of Grey-rumped Sandpipers—the young already very much like the adults—noticeably diminished until the last small flock was recorded on 8th September.

There are a few additional data on breeding from other parts of the range. V. I. Kapitonov found a single chick accompanied by only one adult on 19th July above the tree-line in the Kharaulakh mountains. According to K. A. Vorobiev, Grey-rumped Sandpipers are common on the stony banks and islets of the mountain streams along the upper courses of the Indigirka River (the Olchan and Omuk-Kiurielyakh Rivers). Habitats are rather diverse there, but the birds kept mainly to islands overgrown with polar willow scrub, bilberry and dwarf birches interspersed with open spaces covered with mosses and lichens and sometimes dotted with stones. However, broods were also found rather far from rivers in thin forests of stunted larch where numerous dead trees were lying on the ground and thickets of low bushes alternated with open spaces. The first brood to be recorded by Vorobiev was found as early as 5th July; and he noted that each one was accompanied only by the male, which had no brood patches.

The last Grey-rumped Sandpipers on autumn passage on the north-western coast of the Sea of Okhotsk were observed during 17th-19th September, but in Kamchatka the last of the autumn was seen as late as 4th October. The species is known to winter mainly from the Malay Peninsula to north-western Australia and Queensland and so it is particularly interesting to note that odd Grey-rumped Sandpipers have been recorded in the winter months near hot springs in Kamchatka: this is three or four thousand miles further north than the normal winter range and on the same latitude as Britain.

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Foot-movements in plovers and other birds

By K. E. L. Simmons

WADERS SHOW many striking adaptations in behaviour and structure which enable them to obtain their food. In particular, several types of foot-movements have been evolved and this short paper sketches, informally, something of what is known about these, with special reference to the activities of plovers. There is much scope for study of the various feeding movements of waders; especially, we need more information on the precise function of individual movements.

FOOT-MOVEMENTS IN PLOVERS

"Foot-trembling"

This behaviour has been recorded in at least four species of plover, being especially well known in the Lapwing (*Vanellus vanellus*) (see, for example, Portielje 1922 and Spencer 1953). Contrary to the impression given in the editorial comment to Coleman (1960), "foot-trembling" (or "foot-tapping" or "foot-pattering") when feeding is well known in the Little Ringed Plover (*Charadrius dubius*), having been recorded as long ago as 1915 by Heinroth. I have myself quite recently reported (Simmons 1953b) that this species shares with the Lapwing and the gulls (*Larus* spp.), among others, "one curious habit apparently connected with food-seeking—that of making pattering movements of the feet on mud. In the two plovers this is a trembling action of one foot only while the gulls mark time with both feet." Sluiter (1938) also referred to this behaviour in the Little Ringed Plover, calling the trembling action "leg-shaking" (after Heinroth and Heinroth 1928) and noting that, when trembled, the foot may be lifted up to half an inch above the ground. Sluiter remarked also that, while a somewhat similar habit had been recorded in the Ringed Plover (*Ch. hiaticula*) and in the Kentish Plover (*Ch. alexandrinus*) by Verwey (1926), he himself had never seen obvious foot-trembling in Ringed Plovers though these birds did make some sort of one-leg movement while standing still and before seizing prey. In fact, however, Verwey was referring to the quite definite records of Astley (1923) for the Ringed Plover ("very rapid vibration of one foot on the wet sand") and of Medlicott (1923) for the Kentish Plover (bird stops after a run, taps and "always seems to obtain a morsel"). The Heinroths (1928) observed foot-trembling only in the Lapwing and Little Ringed Plover (captive individuals of which would even perform on hard surfaces, such as linoleum and wooden floors), and their Ringed and Kentish Plovers were not seen to perform any comparable foot-movements. There seems little doubt, however, that these species do foot-tremble (see above and, also, Tucker 1940).

Other foot-movements

The relationship between the one-legged foot-trembling and the various two-legged movements of the Little Ringed Plover and related species also needs to be examined. Most (probably all) plovers use two-footed movements in forming the nest-scape and in egg-uncovering ("scraping"), and also in the pre-copulatory display ("marking-time"), the latter activity perhaps being rarer in the Kentish Plover (J. Walters *in litt.*). A few species, notably Kittlitz's Sandplover (*Ch. pecuarius*), also cover the eggs with sand on leaving the nest, using special leg-movements (see, particularly, Hall 1958).

When scraping, the male Little Ringed Plover (for example) forms or enlarges a hollow "by leaning forward and rotating on his breast, body and tail slanting up, feet scratching backwards" (Simmons 1953b). The same scraping movements are done by both sexes of the Little Ringed and Kentish Plovers when retrieving buried eggs, though they usually probe with the bill first (Walters 1956). The relation between these scraping movements and those used by Kittlitz's and other plovers in hiding the eggs is less clear. Superficially they seem to be similar but the egg-covering ones have a sideways orientation apparently lacking in normal scraping and there are other differences (see Hall 1960). The marking-time actions are quite distinct from foot-trembling and from the various scraping movements. When marking-time, the male Little Ringed Plover (for example) approaches the female, his footsteps getting "progressively shorter and shorter, and higher and higher until, when he stands over her . . . he is 'marking-time' vigorously on the spot, sometimes with such exaggeration that he may actually strike his breast with the alternately raised feet" (Simmons 1953a).

There have been attempts to equate foot-trembling with some or all of these two-legged movements (e.g. Tucker 1940, Armstrong 1950, Milon 1951), but these seem ill-advised. Armstrong and others have suggested that marking-time derives from foot-trembling, "entering" courtship as a displacement-activity. There has obviously been confusion here with the superficially similar foot-paddling of gulls (as there was also, in a different context, in Simmons 1950). I put forward an alternative explanation (Simmons 1953a), namely that marking-time was "more likely an inhibited locomotory movement". It may be added that such behaviour is now ritualised and that it is equally likely that, instead of being derived from inhibited approach movements, marking-time is based on inhibited mounting movements.

FOOT-MOVEMENTS IN OTHER BIRDS WHEN FEEDING

As indicated by Portielje (1922) and Verwey (1926), foot-trembling seems confined to the true plovers. Portielje did not observe it in other wader species watched by him, including the Ruff (*Philomachus*

pugnax), Black-tailed Godwit (*Limosa limosa*), Redshank (*Tringa totanus*) and Curlew (*Numenius arquata*). However, some other movements have been recorded and may be mentioned briefly.

"Foot-paddling" and "jumping"

"Foot-paddling" (or "foot-trampling" or, when done in water, "puddling") is apparently common in scolapacine waders. The Woodcock (*Scolopax rusticola*) tramples before probing (Heinroth, quoted by Tucker 1940; Portielje, quoted by Tinbergen 1953). The Dunlin (*Calidris alpina*), together with its allies, "will sometimes patter on the mud or sand with its feet or jump up with both feet together" (Tucker 1940), similar "jumping and dancing" on the sand being mentioned by Ticehurst (1923). The Redshank, also, will "jump" up and down on the mud when feeding (Tucker 1940). Recently, Meyerriecks (1959) described a Semipalmated Sandpiper (*Calidris pusilla*) seen foot-paddling in a small pool formed by the incoming tide. It alternately lifted and depressed its legs very rapidly for about ten seconds before peering at the surface and then stabbing (not probing) rapidly with its bill, making brief swallowing movements afterwards.

Two-footed paddling is also very well known in gulls (see Portielje 1928 and Tinbergen 1953; also, for example, Colthrup 1923, Savage 1923 and Robinson 1923). It also occurs in the ducks, geese and swans, in the flamingos and in the herons.

Other movements

The "pirouetting" of phalaropes (*Phalaropus* spp.), chiefly in shallow water, is too well known to require further description (see Tinbergen 1935, 1953, Tucker 1940) but the "rushing" behaviour in shallow water of certain other scolapacine waders, e.g. Green Sandpiper (*Tringa ochropus*) and Greenshank (*T. nebularia*), has been much less fully documented. Greenshanks have been seen running about quite fast with high steps, sharply and abruptly changing direction, before settling down to quiet, normal feeding (Simmons 1951). While an element of fear could be involved in such behaviour, it seems more likely that such movements help in uncovering prey (see below).

THE FUNCTION OF FOOT-TREMBLING AND OTHER FEEDING MOVEMENTS

Worms

Burrow-haunting, segmented worms (Annelida) figure frequently in the diet of many waders and gulls, and the foot-trembling of plovers and the analogous paddling and jumping of other birds are widely supposed to have reference to worms as prey (see titles in the list of references; also, for example, comments in Tucker 1940). Both

Portielje (1922) and Spencer (1953) stressed this in the case of the Lapwing (Portielje mentioning earthworms of the genera *Lumbricus* and *Allolobophora*), while Sluiter (1938) described foot-trembling in the Little Ringed Plover under the heading "worm-drilling". It is clear, however, especially from the discussion in Tinbergen (1953), that this particular interpretation of the function of foot-trembling and paddling is far from settled. These movements are said to exploit the innate escape reaction of the earthworm to soil disturbance caused by the Mole (*Talpa europaea*) but, as Tinbergen points out, only a few species of worm have this reaction. On land, especially in fields (where Lapwings and gulls feed to a large extent), terrestrial earthworms (Oligochaeta) are the main prey and, of these, *Lumbricus* has not got the response to the Mole, whereas *Allolobophora* has. Yet the former apparently figures more frequently in the diet of the birds concerned than does the latter. On the sand and mud of the shore, marine bristle-worms (*Nereis*) and lugworms (*Arenicola*), both polychete worms (Polychaeta), are frequently eaten by birds, yet neither has any reaction to the Mole. As it seems likely, however, that worms are exposed in some way by the various foot-movements (how anecdotal much of the evidence is, is not clear), obviously other phenomena besides a response to the Mole must be involved, including some sort of reaction to vibration from above. Spencer (1953) suggested that the worms may react to the birds' leg-movements as they do to the patter of rain, while Portielje (1928) mentioned that Herring Gulls (*Larus argentatus*) are especially likely to paddle on grass after rain. Earthworms are known to lie nearer the mouths of their burrows in wet weather and thousands appear on the surface after heavy rain. The precise connection (if any) between the effect of rain and of pattering (etc.) on the behaviour of earthworms remains to be investigated. It may well be that the various foot-movements have reference to a wider range of prey and may be of only incidental value in capturing worms (see below).

Other prey

The suggestions which follow all have much to recommend them. Sluiter (1938) thought that the behaviour of Little Ringed Plovers (which are not great worm eaters, apparently) and Lapwings caused "insects" (presumably quite a variety of invertebrates) that were hidden beyond the range of the birds' short bills to come nearer the surface (though the mechanism of this response goes unexplained). In the editorial comment to Coleman's note (1960), it was thought possible that the "more common function of both tapping and paddling is to cause minute organisms to move and thus show themselves". Spencer (1953) also suggested that the pattering of the Lapwing, besides raising worms, "may dislodge other organisms,

bringing them into the Lapwing's view". Pirouetting, rushing and puddling in water all probably function both to whirr up organisms from the bottom or suspended in the water, or to make these move and show themselves (Tinbergen 1935, 1953, Tucker 1940, Simmons 1951).

It may well be, too, that in causing worms of all types merely to move, and thus reveal themselves or the site of their burrows, the pattering and other movements fulfil their function and that one need not seek more complicated answers.

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Notes

Little Shearwater in Norfolk.—On 1st May 1960 we found a freshly dead shearwater on the beach between Cley and Blakeney Point, Norfolk. It was in good condition but for the left carpal joint, which was bare to the bone. The bird was black above and white below, the white extending above the eye; it seemed small and its under tail-coverts were white. These facts made us think that it might be a Little Shearwater of the Madeiran race (*Procellaria b. baroli*) and this was confirmed on our return home when we noted the following characters:

Total length 11½ inches. Bill 25 mm., wing 178 mm., tarsus 38 mm., middle toe with claw 43½ mm., tail 71 mm. Crown, back and tail black; tips of greater wing-coverts grey. Under-parts white, this colour including the under tail-coverts and also extending to a band over the eye; junction of white and black on neck mottled. Bill blue-black; outer toe black; inner toes, webs and tarsus blue-grey.

The corpse was kept in the deep-freeze in the Department of Chemical Engineering at Cambridge and then forwarded to the British Museum (Natural History) in London on 4th May. Our identification was confirmed and the specimen is now preserved there.

C. J. R. THORNE and R. M. NEDDERMAN

[Only six previous records of this species in Britain and Ireland are now accepted and one of those was similarly picked up dead at Blakeney Point on 11th May 1929. All refer to the same race, which nests in the Azores, Salvages, Madeira group and Canaries.—EDS.]

Waxwings feeding on apples and their rate of berry consumption.

On 16th February 1957 two parties of seven and nine Waxwings (*Bombycilla garrulus*) appeared at Holt, Norfolk, where they fed intermittently on the berries of *Cotoneaster* and guelder rose (*Viburnum opulus*), and also on apples. The last-mentioned were mainly lying on the ground beneath the trees of an abandoned orchard, though a few still hung on the branches. The birds used the apple trees as a half-way resting stage between their two main sources of berries, but

for two or three days ignored the apples themselves. Blackbirds (*Turdus merula*) and Starlings (*Sturnus vulgaris*) were, however, feeding on them while the Waxwings were resting in the trees and this probably attracted the attention of the latter to the fruit. (In just the same way House Sparrows (*Passer domesticus*) and Chaffinches (*Fringilla coelebs*) were attracted to the *Cotoneaster* berries and fed greedily on them once the Waxwings had started to do so, although they had previously not touched them.) Once the Waxwings had taken to the apples, they fed first on the fallen fruit which they devoured greedily, hollowing out the "shells" in the same way as the Blackbirds had done. (Incidentally, a number of old "shells" had filled up with water and from these the Waxwings drank regularly between spells of feeding.) Several would sometimes feed on the same apple and frequent squabbles would then take place, although no such arguments occurred when they fed on berries. After several days the Waxwings used their acrobatic ability to eat the few remaining apples on the trees, which had clearly been left untouched only because the Blackbirds and Starlings could not reach them. One bird was seen to devour a complete apple about two and a half inches in diameter in only four visits of from five to seven minutes each.

On the question of quantity of food eaten, it is perhaps relevant to include some observations made on a single bird seen feeding on *Cotoneaster* one day between 10.30 a.m. and 1.0 p.m. During this time the number of visits per hour was six (each lasting four or five minutes) and the average number of berries eaten at each visit was 26. This meant that the bird consumed some 390 berries in two and a half hours. The total weight of this amount of berries would be approximately $2\frac{1}{2}$ ounces or about 70 gm., which seems to be as much as a Waxwing itself weighs, judging from two dead ones (killed by a passing car and a small boy's catapult) which were both as fat as butter and tipped the scales at 63 and 71 gm. Since then I have noted that when feeding on guelder rose, or any other juicy berries with a high moisture content, these birds eat even greater weights of berries and appear to digest them still more quickly.

It is thus hardly surprising that seven Waxwings completely stripped a very heavily laden *Cotoneaster* covering 100 square feet of a cottage wall in only two days. Photographs of these seven at work appear on plates 2 and 3. The cottage was beside a road with people passing constantly, but the birds came down regularly to feed and were quite indifferent to traffic and human beings. Plate 1a shows a Waxwing among the fallen apples on the ground and in plate 1c can be seen the bird which devoured a whole apple in four visits (together with the last part of the fruit). The other main food of these particular birds is illustrated in plate 1b which shows a Waxwing resting among the twigs of a guelder rose.

In conclusion, I might add that in April 1959 I watched and filmed some Waxwings feeding on the buds of hawthorn and blackthorn, which were just opening. There was a certain amount of courtship display in which the male hovered in front of the female offering her a beakful of buds. Incidentally, at this time Waxwings were also eating holly berries and beech buds. R. P. BAGNALL-OAKELEY

[With regard to the number of berries eaten by a Waxwing, it is of interest to draw attention to an observation made at Avoch, Ross-shire, by the Rev. J. Lees in December 1943 (*Brit. Birds*, 41: 8). He watched a single bird feeding on *Cotoneaster* and "in one day it devoured as many as 500 berries which weighed approximately 6 oz."—EDS.]

Reviews

The Eleventh Annual Report of the Wildfowl Trust. Edited by Hugh Boyd and Peter Scott. Wildfowl Trust, Slimbridge, 1960. 168 pages; 32 plates. 10s.

The Wildfowl Trust's Annual Report contains, as usual, a varied assortment of news of the collections and wild geese at Slimbridge, brief reports on scientific work in progress and a number of articles ranging from popular accounts of expeditions to full scientific papers.

The number of European White-fronted Geese at Slimbridge reached 5,000 in mid-February. Four out of a total of 129 ringed were recovered on the spring migration, two in Niedersachsen, Western Germany, and two in Poland, the first recoveries in that country of birds of this species ringed in Britain.

Tests of the effectiveness of aerial survey for studying winter populations of wildfowl were hampered by bad flying conditions, and "experience has shown very clearly that in British conditions photographic recording of wildfowl numbers is so difficult and unreliable that it must be subordinated to direct observation". Even so, interesting information was obtained on the numbers of Barnacle and Brent Geese, and there were 7,200 Brents between Southend and Skegness in February 1959. Sorties were made at other seasons to study the moulting congregation of Shelduck in Bridgwater Bay in Somerset, and to look for breeding Grey Lag Geese and ducks in the Highlands. Not more than 65 geese were found and ducks also were scarce, the conclusion being that it was "unlikely that a significant proportion of the British population of ducks breeds in the North-Western Highlands". It should be noted that the survey did not include Caithness, where the numbers are probably greater.

In a paper on "The Shelduck population in the Bridgwater Bay moulting area" S. K. Eltringham and H. Boyd give an interesting account of the only important known moulting area in Britain. The

peak moulting population in the bay was about 2,700 in October, but there was an appreciable passage in the late summer and early autumn before the final build-up of moulting birds, the two groups overlapping, and in early September there were 3,300 birds. Since the local ducks are too few to account for such numbers they are presumed to come from Ireland.

Paul A. Johnsgard contributes a useful paper on "Comparative behaviour of the Anatidae and its evolutionary implications", in which he reviews what is known of their pair formation, pair bond strength and the effects of sexual selection in the various groups, showing how such knowledge has contributed to taxonomic evaluation. Whereas in most of the Anseranatinae and Anserinae the pair bond is normally lifelong, in most of the Anatinae (except the Tadorcini) it frequently lasts only for a single breeding season. Young geese and swans usually return to their breeding area and "mate with closely related individuals, resulting in local inbreeding and thus favouring subspeciation (Mayr 1942). Migratory ducks of the genus *Anas*, however, normally mate on the wintering grounds" and the drakes follow their mates to the females' breeding area, so that the populations are mixed and less liable to subspeciation. Also, geese and swans do not attain sexual maturity for several years, and have a longer life cycle than ducks which mostly mature in their first year. This contrast, and also probably the different clutch size in the two groups, has a potential effect on the rapidity of evolutionary adaptation. In the swans, geese and possibly shelducks, the pair bond is permanent and "mate selection normally takes place once only", being a "more gradual process which allows for the 'correction' of incipient mating errors between species". Differences in sexual dimorphism and moult are also discussed.

The first of two papers on the Brent Goose consists of a translation of an article by S. M. Uspenski, which originally appeared in *The Migration of Animals No. I* published by the Academy of Sciences of the U.S.S.R. in 1959, and deals with the breeding status and migration of the various races in the Soviet Union. The numbers of all races seem to be greatly reduced and the dangers from persecution to the survival of the species are greatly aggravated by its apparently very erratic breeding success. In the second paper P. J. K. Burton shows that in sample counts in winter in Essex the percentage of first-winter birds has varied in five winters from 53% in 1957-58 to 0.4% in 1958-59, the sample being of about 1,800 birds in each case. Very low breeding success in 1958 has also been noticed in White-fronted Geese and Bewick's Swans.

In "Lead poisoning in wildfowl" P. J. S. Olney describes the symptoms and course of this complaint. It is thought that 60-80% of wild Mallard with one ingested pellet will succumb if they are

feeding on wild seeds, but the mortality may be less if they are taking aquatic plants. In a large sample in the U.S.A. nearly 7% of Mallard whose gizzards were examined were carrying one or more ingested pellets, and the proportion was similar in a much smaller sample in this country.

Compared with studies of wintering populations relatively little has been done in this country on the breeding biology of ducks in the wild, but in "A breeding population of the Mallard" H. Boyd and B. King discuss the situation at four Somerset reservoirs. Early nesting was almost wholly unsuccessful, apparently because of predation due to lack of cover. The population was more or less static during 1954-56 and about double the average for the period 1948-53. Provisional estimates suggest an annual loss of 57% for adults and of 76% for young in the first year after fledging. There seems to be a clear relationship between numbers in late August and the size of the breeding population in the following spring. It is suggested that if this correlation is real, and general, long-term breeding studies might be carried out by a combination of sex-ratio counts in the spring with total counts in August and September.

It is impossible to review here all the papers in this report, but other subjects include the B.B.C./I.U.C.N. Darwin Centenary Expedition, an interim report on wildfowl food research, the threat posture of Canada Geese, injury-feigning in the Anatidae, the Pink-headed Duck (*Rhodonessa caryophyllacea*), goose-netting in the Netherlands, a spring visit to Denmark and duck-catching in Iceland. R. C. HOMES.

Scolt Head Island. Edited by J. A. Steers. Heffer, Cambridge, 1960. 270 pages; 29 photographic plates, many diagrams and maps. 50s.

The original edition of this book was published in 1934, but it has long been out of print. This 1960 edition contains entirely new chapters, whilst others have been largely rewritten to bring the matter up to date. The plates are all new, many maps and diagrams have been added and aerial photos of the whole area keyed to a large folding map of the island.

The subjects covered in this very attractively produced volume include the physiography and evolution of the island, the plant ecology, lichens, fungi, mammals and marine invertebrates. Thirty-three pages are devoted to birds and this section is by Dr. E. A. Duffey. Very detailed and readable accounts are given of the histories of the terns and other shore birds breeding on this National Nature Reserve. Although nearly 200 species have been recorded on the island, only 14 are regular breeders though a further 15 have bred once or are irregular. Several changes in the breeding status of Scolt birds have been recorded since 1923 when the island was handed to the National Trust.

The Common, Sandwich and Little Terns have shown the greatest total increase in spite of considerable fluctuation in numbers. Up to 2,000 pairs of Sandwich, 2,400 pairs of Common and 180 pairs of Little Terns have nested in a single season. A few pairs of Arctic Terns breed, but no Roseates have nested since 1946. Large numbers of terns have been ringed at Scolt since 1954 and recovery details are given. These reveal that some birds ringed as nestlings spend their first summer in West Africa. A full account is given of the nesting of a pair of Kittiwakes in 1946. The nest, apparently the first recorded on a sandy beach, "was constructed among a group of Sandwich terns . . . but was at first mistaken for a black-headed gull's and the first egg was taken . . ."

The bird section also contains tables showing the seasonal abundance of certain ducks and geese; and the frequency of some migrants and winter visitors. The section on migration indicates that much remains to be discovered and valuable ringing could be carried out at Scolt. This book should persuade more bird-watchers to visit the island in spring and autumn.

The half-dozen bird photographs are well chosen and include one of the historic Kittiwake's nest.

M. J. SEAGO.

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

The items here are largely unchecked reports, and must not be regarded as authenticated records. They are selected, on the present writers' judgment alone, from sources generally found to be reliable. Observers' names are usually omitted for reasons of space and in case a report is subsequently rejected, and none of the items will be mentioned in our annual Index. Readers are asked to submit anything of interest as quickly as possible.

This summary is mainly concerned with the two months from mid-October to mid-December, but it also includes some additions for September and early October and these should be looked at against the background given by the lengthy outline in our November number (pp. 529-544).

AMERICAN SPECIES

Only two American birds were reported after the end of October, apart from the Akeagh Lough dowitcher (p. 534) which stayed until at least the middle of November. The first of these was the only American Passerine reported in a remarkable autumn for American waders—a Myrtle Warbler (*Dendroica coronata*) which stayed on Lundy (Devon) from 5th to 14th November. It was trapped and ringed, and at nearly 12 gm. its weight was almost exactly equal to the autumn average for this species as given by Mrs. K. B. Wetherbee (*Bird-Banding*, v: 58-59) on 274 individuals which ranged from 9.2 to 16.4 gm. This suggests that it had been on this side of the Atlantic for some days before it was found on Lundy, unless it was ship-assisted and had managed to obtain adequate food all the way. There is only one previous record of this species in Britain and Ireland, and that was also in Devon where one stayed for over five weeks in January and February 1955 (*Brit. Birds*, 48:

204-207 and plates 25-28). However, there have been at least two records of Myrtle Warblers making almost the complete crossing of the Atlantic until within sight of the Irish coast (*Brit. Birds*, 52: 237-238).

The other American bird to appear during November was an **Upland Sandpiper** (*Bartramia longicauda*) which arrived at the airport on St. Mary's (Isles of Scilly) on the 17th—just 30 days after the one on Skokholm (p. 534)—and stayed there for some time. It seemed to be ailing, could be approached very closely and lived on a grass verge beside a road with continuous traffic. However, we should add here that we have now had details of two more **Pectoral Sandpipers** (*Calidris melanotos*) in mid-September. The first was on Lundy on the 10th and the second on Tory Island (Co. Donegal) on the 14th and 15th. Both were thus in one of the peak periods when six other Pectorals were identified in Anglesey, Caernarvon (Bardsey), Cornwall, Glamorgan and Norfolk (p. 533).

SABINE'S GULLS AND PHALAROPES

Only two **Sabine's Gulls** (*Xema sabini*) were reported after the influx in early October (p. 534), apart from the Portland observations, already given and another at St. Ives (Cornwall) on 19th October: an adult at Portavogie (Co. Down) and an immature at Eastney (Hampshire), both on 4th December. The flocks of **phalaropes** (*Phalaropus* spp.) also dwindled rapidly after the middle of October (pp. 529-531), though on 25th October there were still as many as 120 to be seen off St. Agnes (Isles of Scilly) and two days earlier there had been over 30 off near-by St. Mary's. These, like most of the ones reported earlier, were apparently all **Grey Phalaropes** (*Ph. fulicarius*). During November odd birds and small parties were seen regularly on the south coast, particularly in Cornwall, Devon and to a lesser extent Dorset, though also as far east as Sussex and Dungeness (Kent); and a scattering of single birds as far north as Lancashire in the west (one at Lytham St. Annes on the 13th) and Co. Durham in the east (one at Seaham on the 2nd), and also as far inland as Staffordshire and Warwickshire (singles at Blackbrook sewage farm and Shustoke Reservoir on the 12th and 13th respectively). There were still a few to be seen in Cornwall, Devon and Dorset up to 7th December, but since then we have not heard of any phalaropes at all. The grand total reported during this staggering influx has now risen to over 10,000. To the list of inland stragglers during early October (p. 531) we must add a **Red-necked Phalarope** (*Ph. lobatus*) at Ponders End (Middlesex) on the 1st.

INTERESTING PASSERINES

Fair Isle had its second **Lanceolated Warbler** (*Locustella lanceolata*) of the autumn on 1st November and there were several other reports of rarer warblers which it is interesting to look at in comparison with those listed in November (pp. 538-539). A very late **Aquatic Warbler** (*Acrocephalus paludicola*) was identified at Slapton Ley (Devon) on 6th November. An **Arctic Warbler** (*Phylloscopus borealis*) trapped on Tory Island (Co. Donegal) on 1st September has not previously been mentioned, nor has one at the Isle of May (Fife) on 26th August. Incidentally, the two **Icterine Warblers** (*Hippolais icterina*) at the Isle of May on 29th August actually stayed to the 31st and one of them to the 1st September. A **Yellow-browed Warbler** (*Ph. inornatus*) at Fenwick (Northumberland) on 16th October completes the autumn's already long list of that species. Perhaps the most interesting warbler of all, however, even though it was actually the other side of the Channel, was a **Cetti's Warbler** (*Cettia cetti*) trapped on Jersey (Channel Islands) on 16th-17th October. This species nests quite far north in western France, but is normally sedentary.

Reports of other rarer Passerines have included another **Short-toed Lark** (*Calandrella cinerea*) on Fair Isle on 28th November; male **Golden Orioles** (*Oriolus oriolus*) at Enville (Worcestershire) from early September to early October and below the summit of Moel Famau (North Wales) on 6th November, the latter rather late

and both further north and west than this species usually occurs; a **Desert Wheatear** (*Oenanthe deserti*) at Selsey Bill (Sussex) from late October to 8th November and an apparent **Black Wheatear** (*Oe. leucura*) near Strood (Kent) on 7th November; single **Red-breasted Flycatchers** (*Muscicapa parva*) on St. Mary's Island (Northumberland) on 8th October and at Fife Ness on 17th October, which brought the autumn's total to around 40; **Richard's Pipits** (*Anthus novaeseelandiae*) at Bardsey (Caernarvonshire), Atwick (Yorkshire) and Ynys Llanddwyn (Anglesey) on 18th and 22nd October and 14th November respectively; a **Lesser Grey Shrike** (*Lanius minor*) at Embleton (Northumberland) on 29th October (five days earlier, as already mentioned, p. 540, there was one near Coxhoe in neighbouring Co. Durham); a **Serin** (*Serinus canarius*) at Portland (Dorset) on 12th November and a **Rustic Bunting** (*Emberiza rustica*) on the Isle of May from 29th September to 2nd October.

Firecrests (*Regulus ignicapillus*) actually extended further than we suggested in November (pp. 543-544) because single birds reached Scotland and Ireland, at the Isle of May (Fife) on 22nd September and Cape Clear Island (Co. Cork) on 21st October, only the second and fourth records respectively for these two countries. Firecrests were also seen at Lundy (Devon) on 4th-5th October and 25th-26th November, and at St. Ives (Cornwall) on 9th and 14th November, while other November observations included one at St. Osyth (Essex) on the 27th and the now regular sprinkling at Dungeness (Kent) and Portland (Dorset).

BEARDED TITS, WAXWINGS AND OTHER INVADERS

In the autumn and winter of 1959-60, following a very successful breeding season when the population was unusually high, there was an eruption of **Bearded Tits** (*Panurus biarmicus*) from the reed-beds of East Anglia and parties were recorded as far west as Gloucestershire and Shropshire (*Brit. Birds*, 53: 422-423). Last summer the population was still high in Norfolk and Suffolk and a large number of young were again reared, with the result that, as we mentioned in November (p. 542), the birds again showed signs of breaking out in October. The species has in fact erupted again, but so far the distances covered have not been nearly as spectacular as in 1959-60 and Kent, Middlesex and Hertfordshire seem to be the present limits. Bearded Tits have been reported from about twelve places in Essex—including Walthamstow Reservoirs, where up to 15 were seen from 16th October to at least 12th December, and on the Essex side of Bishop's Stortford, where up to eight stayed from about 28th October to 26th November. Five were trapped and ringed in Kent on 20th November and were still present in December; there was a male at Perry Oaks (Middlesex) from 26th November to the end of the year; two were seen at Broxbourne (Hertfordshire) from 4th November onwards; and four were seen at Wilstone Reservoir (Hertfordshire) on the 13th. During the summer of 1960 over 300 Bearded Tits were ringed at Walberswick (Suffolk) and about half of these were colour-ringed. Anybody seeing a Bearded Tit with a colour ring on one of its legs is asked to get in touch with D. G. Pearson, Gonville and Caius College, Cambridge. Such ringed birds provided the first evidence of movement away from the breeding areas. At Minsmere (Suffolk), for example, a male with a Walberswick ring was seen on 8th August and there were two more there on 18th October. At Minsmere about 18th September the local Bearded Tits began to behave excitedly and fly high into the air, sometimes as much as 300 feet, and they continued this behaviour on most days until the end of October, except when it was windy. Frequent short flights at 100-200 feet were made along the dunes, but such parties were always seen to return, except on 6th October when groups of seven, four and eight moved down the coast until out of sight and did not come back within the next hour. On 25th September a Bearded Tit was seen 20 yards inside the woods at Minsmere!

We mentioned in our last summary (p. 542) that **Waxwings** (*Bombycilla garrulus*) had been seen during October on Fair Isle, in south-east Scotland and at one or two

places on the east coast of England down as far as Kent. In East Lothian in fact, a flock of as many as 40 was seen at Longniddry on 15th November and there were several flocks in the area of Kelso (Roxburghshire) during the first half of November. We have also now heard that small numbers were seen in late October or early November in Inverness-shire and Kincardineshire, but by Christmas there had been no real invasion. The numbers on Fair Isle dropped rapidly away during early November and, though during the rest of that month and in the first three and a half weeks of December small parties were reported from Northumberland, Co. Durham, Yorkshire and Norfolk, the biggest of the very small number of groups reported was only 20 at Middlesbrough from 27th November into December and such a scattering is perfectly normal. The only reports in England away from east coast counties have been single birds at Corby (Northamptonshire) on 14th December and at Sandy (Bedfordshire) on the 24th.

Of the other species that have already been noted as being present in unusual numbers during the late autumn, easily the most widely reported are the **Long-tailed Tits** (*Aegithalos caudatus*). **Great Tits** and **Blue Tits** (*Parus caeruleus* and *major*) have also attracted attention in various parts of England, but increases and movements do not seem to have been on anything like the scale of 1959 (*Brit. Birds*, 53: 140), let alone that of 1957 (53: 49-77, 99-117, 176-192). **Siskins** (*Carduelis spinus*) are widely spread this winter, but there has been little to suggest that the numbers are exceptional following the invasion of these birds in September (pp. 541-542).

A few other species that come in rather a different category might also be mentioned here. It continues to be a good winter for **Great Grey Shrikes** (*Lanius excubitor*); most are in eastern areas, but there are more than usual in SW Scotland (and NW England?) and they have been seen in such inland counties as Derby, Stafford, Huntingdon and Leicester (where there were three in November). **Short-eared Owls** (*Asio flammeus*) are also very numerous in some areas and north of Lincoln a party of about 40 have been feeding and roosting together. There have also been many more reports of **Rough-legged Buzzards** (*Buteo lagopus*) after the October influx we mentioned in November (pp. 537-538). These have been mainly on the east coast, particularly in East Anglia and perhaps especially in Suffolk where at Minsmere and Walberswick, for example, several have been seen at a time. At Minsmere between one and three were noted on seven dates in November and there was one on 4th and 5th December. Further confirmation that there was an influx in the first week of October is provided by an interesting record from quite a different area: about 6th October one landed on board a vessel off the Irish coast; it was brought into Liverpool, and released near Conway (Caernarvonshire) on the 14th.

OTHER RARE OR LESS COMMON SPECIES

There have been rather few reports of the rarer non-Passerines since our last summary and most of those have been aquatic birds. Three **Ferruginous Ducks** (*Aythya nyroca*) were seen in widely separated parts of England during November and December—at Dungeness (Kent) from 8th November, at Leigh Flash (Lancashire) on 9th November and at Holme Pierrepont (near Nottingham) from 8th December to at least the 22nd. Two late **Balearic Shearwaters** (*Procellaria puffinus mauretanicus*) were identified off St. Ives (Cornwall) on 4th December and we take this opportunity of including another report of **Cory's Shearwater** (*P. diomedea*) (cf. p. 536)—one seen flying with Manx Shearwaters (*P. puffinus*) off Erris Head (Co. Mayo) on 4th September. **Mediterranean Gulls** (*Larus melanocephalus*) were reported from two areas where they are not so regularly seen—a first-winter bird at Atwick (Yorkshire) on 16th October and an immature at St. Ives on 26th and 27th November and 10th December. It should also be noted here that the Mediterranean Gull which has spent each of the last four winters at Hartlepool (Co. Durham) and which reappeared there in August 1960 (*Brit. Birds*, 53: 406) was not seen between 18th September and at least the end of November.

Exceptional numbers of **Little Gulls** (*L. minutus*) at Portland (Dorset) between mid-September and mid-October were noted in our last summary (p. 535) and we now learn that even larger numbers occurred there between mid-October and mid-November. They were observed on 12 days altogether, the maxima being 42 or more on 22nd October, 19 on the 23rd, 27 on the 29th, 29 on 5th November and 12 on the 13th. Little Gulls continued to be reported as far west as Cornwall and in greater numbers than usual in eastern areas where they are more regular. The **Purple Heron** (*Ardea purpurea*) on the Plym Estuary (Devon) remained from 7th to 15th October (not just the 8th and 9th as previously reported).

Lastly, four species of birds of prey. **Kites** (*Milvus milvus*) were seen at Selsey Bill (Sussex) on 1st November and at Minsmere (Suffolk) two days later, and there was a **Goshawk** (*Accipiter gentilis*) on the Bedfordshire/Huntingdonshire border on 5th December. The last of the autumn's **Ospreys** (*Pandion haliaëtus*) was reported from Kingsbridge Estuary (Devon) on 23rd October. There were also two other reports of Ospreys in the fourth week of September, which may have been connected with the influx noted in the middle of that month and mentioned in our last summary (p. 537). These were at Cliffe (Kent) on 24th September and Weir Wood Reservoir (Sussex) from 25th September to 8th October. Another bird of prey concerned in the September influx was the **Honey Buzzard** (*Pernis apivorus*) and so it is of interest to add that an immature male was picked up dead on the roadside between Coventry and Rugby (Warwickshire) on or about 22nd September.

LATE SUMMER VISITORS

A striking feature of the late autumn was the number of late records of certain species of summer migrant and this was probably even more marked than in 1958 (*Brit. Birds*, 51: 531-532). The limelight was undoubtedly stolen by the aerial feeders, the **Swifts** (*Apus apus*) and the **Hirundines**. No less than 15 reports of Swifts in October reached us as follows: 1st, Par (Cornwall); 2nd, Fishguard (Pembrokeshire) (two), Eye Brook Reservoir (Leicestershire); 3rd, Blakeney Point (Norfolk) (two), Cley (Norfolk), Hartlepool (Co. Durham); 5th, Bedford (Bedfordshire); 8th, Bishop's Stortford (Hertfordshire), Rye Meads (Hertfordshire), Queen Mary Reservoir (Middlesex); 9th, Abberton Reservoir (Essex), Portland (Dorset), Tonbridge (Kent); 27th, St. Margaret's (Kent); 28th, Cley (Norfolk); and 30th, Shellness (Kent). The last two dates are quite extraordinary—and yet another four weeks later, on 28th November, a Swift was reported from Gillingham (Kent). **Swallows** (*Hirundo rustica*) were still being seen in many parts of Britain at the end of October and the beginning of November as far north as Ross-shire, Midlothian and Berwickshire. Stragglers then are of course normal, but the number of them this year seemed far greater than usual and there were still frequent scattered reports up to the third week of November, though by this time the majority were from southern England. In the last ten days of November odd birds were still being seen as far north as Co. Durham and more particularly on the south coast from Kent to Dorset, Devon and Cornwall. In Sussex there was one just over the border from Newenden (Kent) on 1st December and one at Lancing on the 2nd. As far north as Yorkshire one was seen at Hornsea on 3rd December and there were two at Hornsea Mere on the 4th. The latest report of all came from Minsmere (Suffolk) where one was seen on 6th December after there had been two on the 2nd. The same locality produced the last reports of **House Martins** (*Delichon urbica*) with two on 7th and 8th December. House Martins were not as numerous as Swallows during November and there were far less reports after the middle of that month, but they were also noted in Kent and Devon to 5th December. **Sand Martins** (*Riparia riparia*) normally leave much earlier than the other two species of Hirundines and November reports are quite exceptional, but one was seen at Chattenden (Kent) on 6th November and, still more remarkable, there was one at Widnerpool (Nottinghamshire) on 1st December.

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1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

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4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

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PLATE 9. Dorsal view of hybrid Tufted Duck x Pochard (*Aythya fuligula* x *ferina*) shot Sutton Courtenay, Berkshire, March 1960 (*centre*), in comparison with Lesser Scaup (*A. affinis*) (*right*) and Scaup (*A. marila*), all drakes (pages 49-54). The hybrid's mantle is whitish finely vermiculated with dark grey and more uniform than the coarsely marked mantles of the two scaups. Its head is coppery brown with some purple gloss, while the Lesser Scaup's is black with a purple or green gloss and no brown. Note the broad black tip to the bill (*photo: Christopher Perrins*)

British Birds

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PURCHASED

The "Lesser Scaup" problem

By Christopher Perrins

(Plate 9)

DURING THE PAST FOUR WINTERS there have been a number of observations in Britain of ducks that were thought to be Lesser Scaups (*Aythya affinis*), a North American species not recorded in Europe. This note is based on a detailed examination of one of these—that first seen at Sutton Courtenay, Berkshire, in December 1957 and subsequently watched by a very large number of observers. This bird was present for three to four months in each of the winters 1957-58, 1958-59 and 1959-60, disappearing at the end of March in the first two. During this time there was little change in its plumage and it is safe to assume that by March 1960 it was in full adult dress. It was clearly a drake.

Soon after it had been identified as a Lesser Scaup, two Americans, Drs. R. A. MacArthur and F. A. Pitelka, saw the bird and thought that it was not a Lesser Scaup. They gave head shape and large size as the reasons for their decision. British ornithologists became divided on the matter, many still believing that it was a Lesser Scaup, but some considering it to be probably a hybrid. As opinions differed so widely, it was eventually decided to obtain a permit to collect it. It was shot on 3rd March 1960, under a licence issued to Dr. I. C. T. Nisbet by the Nature Conservancy.

Comparison with live specimens at Slimbridge and with museum material at Oxford then confirmed the belief that it was not a Lesser Scaup, for the following reasons:

(a) **Size.** In the field it had appeared a little longer than Tufted Ducks (*A. fuligula*) it accompanied and considerably "broader in the beam" when seen end-on. If the Slimbridge specimens of Lesser Scaup are

representative, this species truly qualifies for the name "Lesser", as these birds are distinctly smaller than the Ring-necked Ducks (*A. collaris*) which are on the same pool and which are comparable with Tufted Ducks in size. The following wing-measurements (from Delacour 1959) are of drakes of some of the *Aythya* species, compared with that of the Sutton Courtenay specimen (while these give an idea of the order of size, they do not necessarily reflect the body shape of the bird or give an accurate estimate of bulk):

Lesser Scaup (<i>A. affinis</i>)	190-201 mm.
Ring-necked Duck (<i>A. collaris</i>)	195-206 mm.
Tufted Duck (<i>A. fuligula</i>)	198-208 mm.
Sutton Courtenay bird	213 mm.
Pochard (<i>A. ferina</i>)	211-220 mm.
Common Scaup (<i>A. marila</i>)	220-230 mm.

(b) **Shape of head.** The forehead rises fairly steeply and the highest point of the head is almost immediately above the eye, whereas in the Lesser Scaup the forehead rises more steeply, the head is more domed and the highest point is behind the eye. There is a "kink" in the nape, rather similar to that in the Ring-necked Duck, but further down the back of the head than in the Lesser Scaup. This "kink" is at the termination of a small crest of feathers which hug the contours of the head so closely that I only once saw it blown aside in the field.

(c) **Colour of head.** In the field the head showed black with a strong brownish-purple gloss; in the hand it can be seen that the feathers are a deep coppery brown and in some lights have a purple gloss. The head of the Lesser Scaup is black with a purple or sometimes a greenish gloss, but there is no brown coloration in the feathers.

(d) **Mantle.** In the field the mantle appeared a drab, uniform grey; at close quarters or in the hand it is possible to see that this is caused by a fine, dark grey vermiculation on a pale, whitish ground (plate 9). Both Scaups have a much more heavily patterned, far less uniform back on which the barring is visible at some distance in the field. (For later reference it is necessary to note that the black back of the Tufted Duck shows a fine peppery vermiculation.)

(e) **Bill.** In life and when the bird was freshly dead, the bill was bluish with a broad black tip and base (Fig. 1c). It is almost parallel-sided, the breadth at the tip and base being, respectively, 21 and 20.5 mm. Both scaups have markedly spatulate bills with black only on the nail (Figs. 1a and 1b).

(f) **Wing-bar.** The white wing-bar extends from the secondaries along the primaries where it is less pure in colour. Though obvious

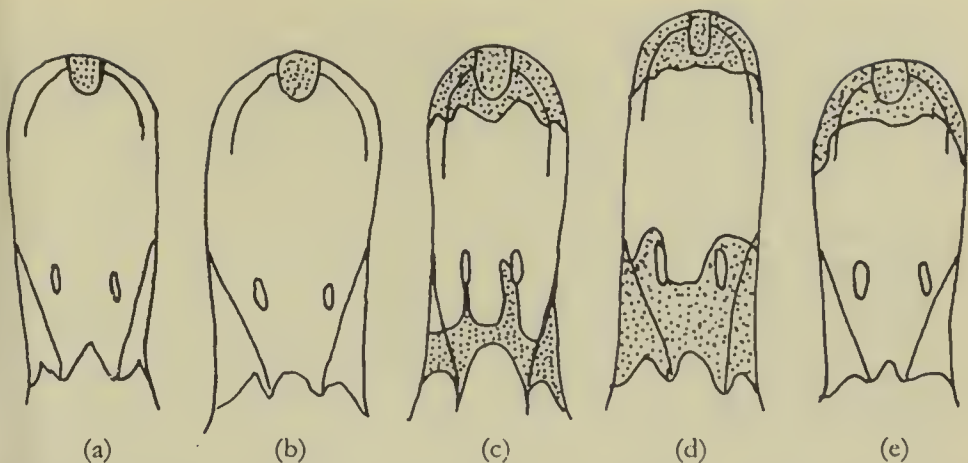


FIG. 1. Bills of (a) Lesser Scaup (*Aythya affinis*), (b) Common Scaup (*A. marila*), (c) the Sutton Courtenay hybrid (presumably *A. fuligula* \times *A. ferina*), (d) Pochard (*A. ferina*) and (e) Tufted Duck (*A. fuligula*). (Each is taken from an average specimen and black areas are shown stippled.) Note that the two scaups have markedly spatulate bills with black only on the nail, while the hybrid has the broad black tip that is shared by both its presumed parents and also the black base that is otherwise found only in the Pochard and the Canvasback (*A. valisineria*) of America

in flight it gave a far less sharply contrasting black-and-white appearance than that of the Tufted Duck. This is due in part to there being a fine stippling of grey in the rather dirty white of the secondaries (as is found in the Pochard) with no sharp delineation between pure white and the black tips as is found in the Tufted Duck and the Lesser Scaup. In fact there is scarcely any sign of tips of darker colour on the inner secondaries, while the outer ones have only rather indistinct tips. The Lesser Scaup has a white wing-bar on the secondaries, but it does not usually extend on to the primaries, though this is variable.

(g) **Colour of eye.** The eye was amber, more orange than in the Tufted Duck or either of the scaups.

These characters also preclude the possibility of its being any other known species. Presumably, therefore, it is a hybrid. The adherents of this theory were divided over the question of the bird's possible parentage. A paper by Voous (1955) describes two supposed Tufted Duck \times Common Scaup hybrids and their resemblance to Lesser Scaup. The present specimen, however, is presumably a hybrid between a Tufted Duck and a Pochard. Within the genus *Aythya* a crest is found only in the Tufted Duck (though there is a small one in the Ring-necked Duck) while a red head, a deeper-than-yellow eye and a black base to the bill occur only in the Pochard and the Canvasback (*A. valisineria*). The Tufted Duck \times Pochard view is strongly supported by the fact that all the characters (a-g) listed above are found in one

of these two species or are intermediate between them and that there are no other characters which disagree with this. It has been possible to exclude all the other species of *Aythya* (including Ring-necked Duck and Canvasback) as likely parents, because each of them possesses one or more additional characters, some of which might be expected to appear in a hybrid, but which are not present in this specimen. A detailed description of the specimen appears in the appendix on the next page.

It is worth noting that these two species, Pochard and Tufted Duck, are the only two members of this genus which breed in Britain and that they are commonly found nesting by the same pieces of water. Thus they have the greatest opportunity, from the distributional point of view, of producing hybrids which will later be seen in Britain. Gray (1958) lists this cross as having occurred in both directions and states that fertile drake hybrids have been recorded. It is therefore probable that more of these birds will be seen in the future and, if they are fertile and breed, some even more confusing specimens may occur through back-crossing.

As mentioned above, Voous (1955) recorded two specimens (both in the Zoological Museum of Amsterdam) of Tufted Duck \times Common Scaup hybrids. The photographs and descriptions of these, however, suggest a marked similarity to the Sutton Courtenay specimen and might easily be confused with it.

Further evidence of the occurrence of Tufted Duck \times Pochard hybrids was recently provided by Bezzel (1960). Watching on the Ismaning, near Munich, Germany, he recorded such hybrids in eight of the years between 1934 and 1959. His descriptions of these birds differ little from that of the Sutton Courtenay specimen, though some were noted as having red eyes and the crest was not always evident. In April, during migration, there are often many more female than male Pochard in that part of Germany and a few more male than female Tufted Duck. He suggested that it is at this time that the hybrid pairs are formed. Some displays of the two species are rather similar and a display shown by a hybrid male resembled parts of the displays of each parent species. In addition, a hybrid was seen displaying to a female Pochard and he described the supposed offspring of a hybrid \times Pochard back-cross. Bezzel's paper also includes references to other records of hybrids.

In view of the confusion which the Sutton Courtenay specimen caused among ornithologists it would seem that any future reports of Lesser Scaup must be treated with extreme caution and that exceptionally good views of all the characters of this species would be essential before the admittance of the Lesser Scaup to the British and Irish List could even be considered.

Among the many ornithologists with whom I have discussed this specimen I am particularly grateful to Drs. I. C. T. Nisbet and A. J. Cain for their comments and for the latter's permission to use for comparison the material in the Oxford University Museum where the specimen (No. B/4171) is now lodged.

APPENDIX—DETAILED PLUMAGE DESCRIPTION

Crown and ear-coverts: feathers copper-brown tipped blackish, giving a faint banded appearance

Forehead, cheeks and lores: blackish with faint copper brown markings

Chin and throat: blackish-brown

Area between ear-coverts and centre of nape: blackish, strongly glossed purple in some lights

Centre of nape, sides of breast and upper breast: black

Breast: browner than above, tips of feathers creamy-white

Belly and sides of body: feathers pale grey with broad whitish tips, giving a general appearance of dirty white under-parts

Vent: feathers greyish-brown, finely vermiculated with white

Flanks: whitish finely vermiculated with greyish-brown

Axillaries: pure white

Under-wing coverts: large inner ones vermiculate grey-brown and white, the rest mainly white except for those on leading edge of outer wing which are greyish

Back: dark greyish-brown with fine bands of white

Scapulars: as back, but with more white

Rump and upper tail-coverts: black

Tail: sepia

Primaries: outer webs of outer four sepia with increasing amounts of ash-grey spreading from the quill (the outermost having the least); outer webs of rest and inner webs of all ash-grey with faint brownish tinge, becoming paler on the inner feathers; outer and inner webs of all primaries have a half-inch tip of blackish-sepia

Secondaries: outer two greyish, rest whitish; outer ones with a quarter-inch tip of greyish-sepia vermiculated with creamy-white, this tip becoming progressively larger and more vermiculated on the inner secondaries until the innermost but one, where nearly the whole feather is vermiculated cream and grey; innermost grey on outer web, grey-brown on inner

Tertiaries: sepia with a few small white dots near tips

Bastard wing and primary coverts: sepia with faint white flecks at tips

All other coverts: dark greyish-brown with pale greyish-brown vermiculation

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[In the autumn of 1958, after consultation with Messrs. Peter Scott and R. Wagstaffe, among others, the Records Committee of the British

Ornithologists' Union came to the conclusion that the four or five "Lesser Scaups" reported during the previous winter (including the Sutton Courtenay bird) were probably hybrids of some sort and that therefore the species could not be admitted to the British and Irish List. This view was supported when, in the following winter, Mr. E. H. Gillham was able to take a very detailed description of one of these birds which spent some time in St. James's Park, London: among the points that were wrong for Lesser Scaup were size, mantle pattern, iris colour and a broad black tip to the bill such as the Sutton Courtenay bird had. Until a specimen could be examined in the hand, however, the solution of the problem had to remain a matter of opinion and it was decided not to make any full statement on the subject until more evidence was available. Now that we have this evidence and the conclusions that are set out with it above, it must be assumed that all the other "Lesser Scaups" reported have been hybrids. Since the winter of 1957-58 more than a dozen of these birds have been seen in southern England—Gloucestershire, Berkshire, Surrey, Middlesex, Essex and Cambridgeshire, for example—and some have reappeared in successive years.—EDS.]

An interpretation of variation in the dark-headed forms of the Yellow Wagtail

By Lasse Sammalisto

Institute of Genetics, University of Helsinki

INTRODUCTION

THERE HAVE BEEN several different interpretations of the puzzling variation to be seen in the Yellow Wagtail (*Motacilla flava*). The chief mistake made by most investigators has been that of splitting the group into too many forms on the basis of too few specimens, the most flagrant example of this being in the monograph by Grant and Mackworth-Praed (1952) who listed no less than seven species and 22 races. The apparent confusion in the variation led Meinertzhagen (1954) to the obvious overstatement that it is just the reverse of clinal, while various complicated interpretations have caused much unjustified speculation about the evolutionary history of the group. However, a great step towards the solution of the problem was made by Williamson (1955) when he stressed the importance of secondary contact between populations as a cause of increasing variability in many areas.

Mayr (1956) pointed out that further studies will not throw much light on the problem if they are based solely on specimens in museum collections; and, though the field studies of Schwarz (1956) in Switzerland, of K. Curry-Lindahl (*in litt.*) in Sweden and of myself (Sammalisto 1956 and 1958) in Fenno-Scandia, particularly in Finland, have so far perhaps raised more questions than they have solved, this line of investigation is still indisputably the most promising. Nevertheless, in this paper I do propose to look at the variation on the basis of museum specimens alone. There is a special reason for this, since it appears to me that one important geographical variable has been ignored in all earlier investigations and that a study of this variable may allow a relatively simple interpretation of the variation in the Yellow Wagtail complex.

MATERIAL AND METHODS

There is no complete agreement on whether the dark-headed forms are specifically distinct from the yellow-headed ones. Williamson, for example, considered the two groups to be separate species, while Vaurie (1957) thought that this was not the case. Whatever the taxonomic situation may be, however, the influence of the yellow-headed populations on the dark-headed ones is not very strong, as is shown on page 66. The yellow-heads are therefore omitted from this paper.

The geographical variation in the dark-headed forms is most remarkable in the following respects:

- (1) The coloration of the head, which varies from white to glossy black.
- (2) The white supercilium, which may reach from the base of the bill to the neck or may be lacking altogether, every intermediate between these two extremes occurring.
- (3) The colour of the chin and throat, which may be yellow or white, the amount of the latter colour varying very gradually.
- (4) The length of the hind-claw, which varies from 6 mm. to 15 mm.

This variation concerns only the males, however. Although it is possible in some areas—in Finland, for instance—to distinguish between female populations too, this cannot be done over the whole range. Therefore, females have not been studied in this analysis. Only males known with certainty to have been shot on their breeding grounds have been included. To measure the extent of the variation I have examined about 800 specimens in the thirteen institutes listed on page 67. The amounts of black on the head and white on the chin have been estimated in every possible case, and these estimates have been expressed as percentages of a standard value, as has the size of the



FIG. 1. Diagrammatic sketches of the heads of representative males of the three main groups of dark-headed Yellow Wagtails (*Motacilla flava*), to show the standards (100%) used in estimating (*left*) the size of the supercilium, (*centre*) the amount of black on the head and (*right*) the amount of white on the chin and throat (see Figs. 2-4 and Tables 1-3)

supercilium (Fig. 1). Measurements of the length of the hind-claw have been taken in millimetres and are accurate to within 0.5 mm. It should be noted that, because of the bad condition of many specimens, not all measurements could be taken in every case and therefore the corresponding totals in Tables 1-4 are not always the same.

The range of the group has been divided into 17 parts, on the basis of what is known from earlier investigations (Johansen 1946, Mayaud 1952, Williamson 1955, Schwarz 1956, Sammalisto 1956, 1958, Meinertzhagen 1954, Kumari 1940, R. Kroneisl-Rucner orally, and Mayr and Greenway 1960) of the border areas of the different populations. There is one exception: the line which starts from western Europe (the race *flava**) and leads to the pale-headed population of south-west Siberia (*beema*), culminating in the completely white-headed population of outer Mongolia (*leucocephala*), has been omitted. This may be regarded as a simple case of primary intergradation, probably due to a loss of the alleles† which produce the coloration of the head (Johansen 1946). These populations are mentioned in this paper only if there is reason to suspect that they have affected the variability in the neighbouring ones.

The whole area is thus divided into the following parts:

- (A) **South-west Europe:** the Iberian peninsula and south France (the area of the race *iberiae*)
- (B) **Central Europe:** France (with the exception of the southernmost part), Belgium, Netherlands, Germany, Denmark, South Sweden and the westernmost coastal area of Norway (Jaeren) (*flava*). (Unfortunately, there are no data from Switzerland, Austria and Czechoslovakia)
- (C) **Central Mediterranean Europe:** Italy and west Yugoslavia (Dalmatia) (*cinereocapilla*)
- (D) **Egypt** (*pygmaea*)

*The nomenclature in this paper follows that of Williamson (1955), with slight modifications.

†See GLOSSARY OF GENETIC TERMS on page 68.

- (E) South-east Europe: south-east Yugoslavia, Albania, Greece, Bulgaria, Turkey, Lebanon, Syria, Jordan, Iraq and Iran (*feldegg*)
- (F) South Russia: Ukraine, Kursk, Voronezh, Rostov and Krasnodar districts (*dombrowskii*)
- (G) The middle of European Russia: Latvia, Lithuania, and White Russia; Kaliningrad, Yaroslavl, Ivanovo, Ryazin, Kuibyzhev, Chkalov and Saratov districts (*flava*)
- (H) South Finland: including also Estonia and the Leningrad district (*flava* \geq *thunbergi*)
- (I) North Fennoscandia: Norway (with the exception of Jaeren), north Sweden and north Finland (*thunbergi*)
- (J) North Russia: east Karelia, Northern, Kirovsk and Sverdlovsk districts (*thunbergi*)
- (K) The Kalmuck Steppes and the Transcaspiian region (*superciliaris*)
- (L) Kazakstan, Dzungaria, and Russian Turkestan (*zaisanensis*)
- (M) North-west Siberia: Omsk district (with the exception of the southernmost part), the northern half of the West Siberian district, and Krasnoyarsk district (with the exception of the southernmost part) (*thunbergi* \geq *plexa*). (The remaining parts of these three districts, and in addition the Chelyabinsk district, are breeding areas of the pale-headed form (*beema*) mentioned above)
- (N) The middle of Siberia: north Mongolia and the East Siberian district (*plexa*)
- (O) Yakutia (*plexa* \geq *simillima*)
- (P) Ussuria (*thunbergi*, or *macronyx* of many authors)
- (Q) North-east Siberia: the coast of the Sea of Okhotsk, Sakhalin, the Kamchatka peninsula, the Chuckchee peninsula, and west Alaska (*simillima* and *tschutschensis*).

RESULTS

The variation in all four variables is given in Tables 1-4 on pages 59-64, and is shown also in Figs. 2-4. As may be seen from the means, the populations can be divided into several groups, using different variables successively as criteria:

1st (supercilium) group. If we use the size of the supercilium as our first criterion, we can divide the populations into two distinctly different groups (Fig. 2 and Table 1): a homogeneous one with a mean varying from 82 to 90, and a heterogeneous one in which the mean varies from 0 to 50. Geographically, the area of the former group extends from western Europe through central Europe (*flava*), south and central Russia (*dombrowskii* \geq *flava*) and Kazakstan (*zaisanensis*) to north-east Siberia (*simillima*) and Alaska (*tschutschensis*), interrupted by the divergent population of the middle of Siberia and Yakutia (*plexa* \geq *thunbergi*). This group is very homogeneous with regard to the amount of black, too: the mean varies from 0 to 7, but the only populations having no black at all are those of west and central Europe and central Russia. These populations, which thus seem to be the purest ones, differ from the others in having very little white on

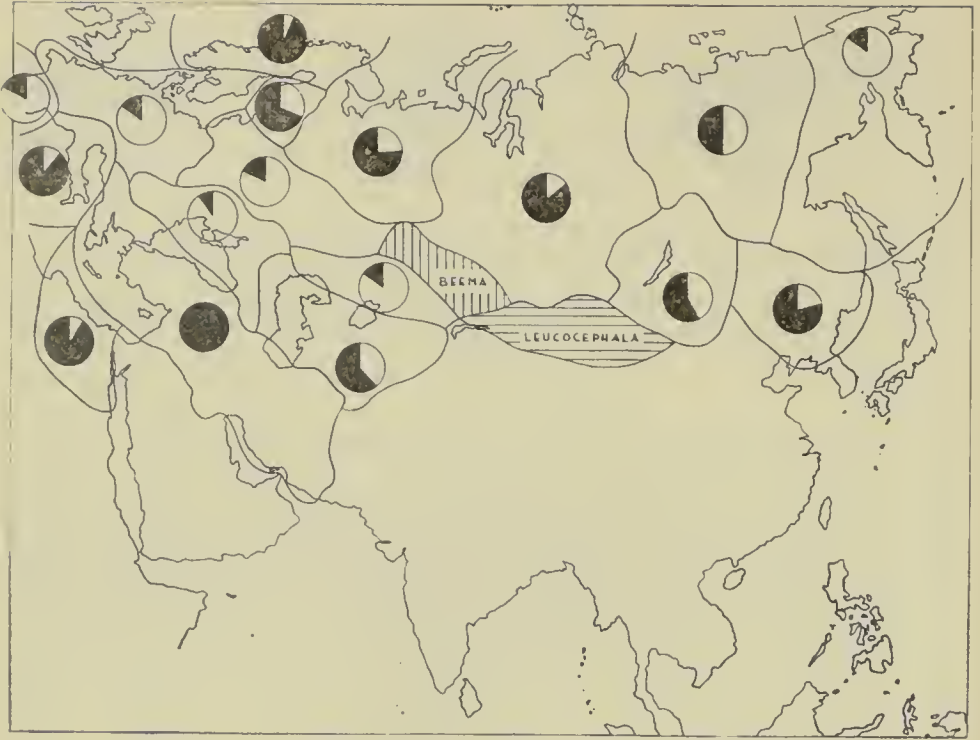


FIG. 2. The size of the supercilium in different dark-headed populations of the Yellow Wagtail (*Motacilla flava*). The circles mark the approximate centres of the seventeen areas on pages 56-57 and the white portion of each denotes the average supercilium size of that population, expressed as a percentage of the standard illustrated in Fig. 1 (left) (see also Table 1). A completely white circle thus represents 100%

the chin and throat. There is a clear progression from west to east in the length of the hind-claw, as already established by Johansen (1946), with the exception of the Kazakhstan population (*zaissanensis*) in which the hind-claw is not longer than in the European one. Below, this group, comprising thus the races *flava*, *dombrowskii*, *zaissanensis*, *simillima* and *tschutschensis*, is referred to as the "supercilium group".

2nd (black-headed) group. In the remaining populations, it is easy to separate subgroups (Fig. 3). Firstly, the Middle East and south-east European populations (*feldegg*, including *superciliaris*) which have very much black in the head—the mean varies from 330 to 500—stand out from all the others, in which the corresponding mean is at most 42. There is no white on the chin and throat in the black-headed populations and, except in the north-eastern part of their range (*superciliaris*), there is no supercilium.

Secondly, I stated above that the purest populations in the "supercilium group" have very little white on the chin and throat. This prompts me to use the colour of the chin and throat as the third

VARIATION IN DARK-HEADED YELLOW WAGTAILS

TABLE 1—THE SIZE OF THE SUPERCILIUM IN DIFFERENT DARK-HEADED POPULATIONS OF THE YELLOW WAGTAIL (*Motacilla flava*)

size of the supercilium is expressed as a percentage of the standard illustrated in Fig. 1 on page 56. The grouping of the various populations as "supercilium forms", "black-ed forms" and "intermediary forms" is explained on pages 57-63. The letters A-Q correspond the areas on pages 56-57 and the italics figure immediately under each letter denotes the number of specimens on which the percentages for that area are based.

Supercilium forms						Black-headed forms						Intermediary forms					
A	B	F	G	L	Q	E	I	J	K	M	P	C	D	H	N	O	
33	63	78	80	28	39	69	111	24	4	20	51	79	6	32	25	18	
<hr/>						<hr/>						<hr/>					
1		2	1			69	88	13	2	15	26	56	3	17	5	3	
							11	1			5	7		1	4	1	
			3				5				5	3			2		
							2	2		1	3	4	1	1	2	2	
2	1	1	2		1		2				4	1	2	1		2	
1	4	2	4					2		2		1		1	2	2	
4	2	1	2	3	4			4			1	2		3	2		
4	4	4	6	5	4					1	1	2		2	1	3	
	8	9	16	3	7		2	1	1	1	3	1		2	2	2	
5	14	10	22	6	8			1			2	1		1	5	2	
16	30	49	24	9	15		1				2	1		3		1	
				2													
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age (°)	82	89	90	82	87	86	0	6	24	38	14	21	11	18	31	42	50

criterion, and Table 3 shows that there is a homogeneous group in which the mean for this trait varies from 6 to 9 and another heterogeneous group in which the mean varies from 12 to 85 (Fig. 4). In the homogeneous group the amount of black increases steadily from east to west; like the area of the first group, this line of primary intergradation is interrupted by the populations of the middle of Siberia and Yakutia. I have earlier suggested (Sammalisto 1956) that the more or less completely black-headed population (*feldegg*) of the Middle East and south-east Europe is a continuation of this northern cline; the geographical and morphological gap between it and the westernmost populations of the northern cline (*thunbergi*) may be due to the isolating effect of the Ice Age followed by the expansion of the European population eastwards. The length of the hind-claw in the third group increases from west to east; this fits in well with the suggestion just mentioned, because the population of the Middle East and south-east Europe possesses a very short hind-claw. The cline in the length of the supercilium of this group is not as clear-cut as that in the amount of black: the Asiatic populations do not differ markedly from each other in the length of the supercilium but the westernmost (*thunbergi*) usually has no supercilium and the Middle

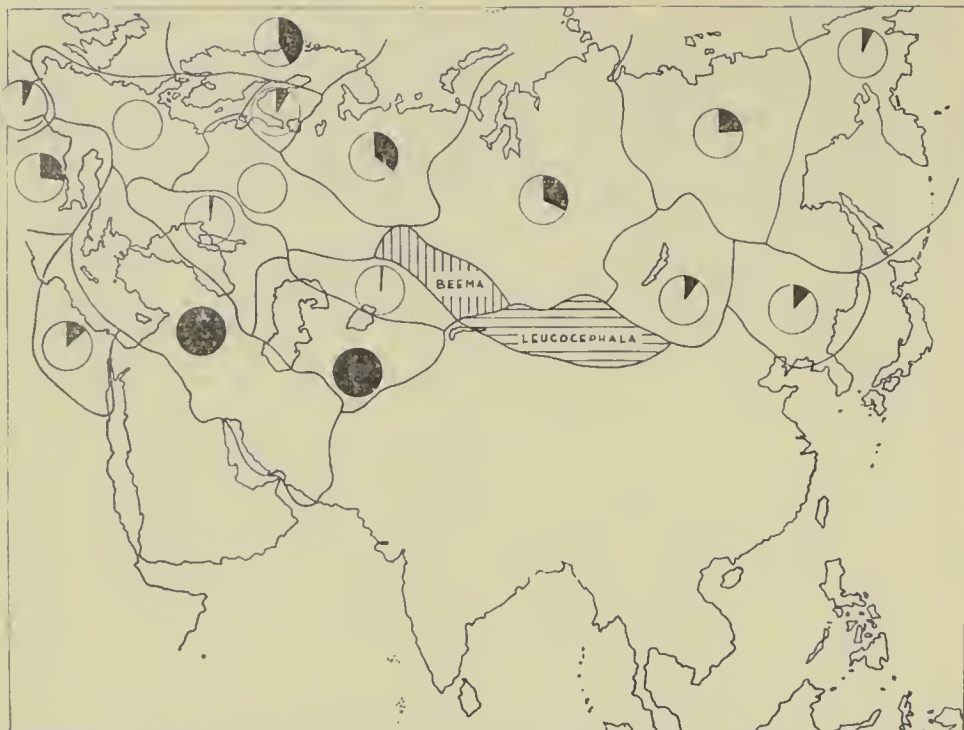


FIG. 3. The amount of black on the head in different dark-headed populations of the Yellow Wagtail (*Motacilla flava*). The circles mark the approximate centres of the seventeen areas on pages 56-57 and the *black* portion of each denotes the average amount of black on the heads of that population, expressed as a percentage of the standard illustrated in Fig. 1 (*centre*) (see also Table 2). A completely black circle thus represents 100% except in the cases of the black-crowned populations in areas E and K (see pages 58 and 61)

East and south-east European one lacks it completely (with the exception of the subpopulation *superciliaris* in the north-eastern part of that area, which will be discussed later).

Below, therefore, the subdivisions of the 2nd group are treated as one under the name "black-headed group".

3rd (intermediary) group. The remaining five populations, despite their apparent dissimilarity, possess several important features in common if we take into account all the criteria used up to now, and in addition the geographical one:

(1) There are moderate amounts of black, averaging from 9 to 26, and at the same time a more or less well developed supercilium, with the means varying from 8 to 50.

(2) Three of the five populations are situated geographically between the areas of the "supercilium group" and the "black-headed group" (for the two exceptions, see below).

(3) There are moderate or considerable amounts of white on the chin and throat, the means varying from 12 to 85.

VARIATION IN DARK-HEADED YELLOW WAGTAILS

TABLE 2—THE AMOUNT OF BLACK ON THE HEAD IN DIFFERENT DARK-HEADED POPULATIONS OF THE YELLOW WAGTAIL (*Motacilla flava*)
 amount of black is expressed as a percentage of the standard illustrated in Fig. 1 (centre) page 56. The grouping of the various populations as “supercilium forms”, “black-headed forms” and “intermediary forms” is explained on pages 57-63. The letters A-Q correspond with areas on pages 56-57 and the italics figure immediately under each letter denotes the number of specimens on which the percentages for that area are based.

Supercilium forms						Black-headed forms						Intermediary forms					
A	B	F	G	L	Q	E	I	J	K	M	P	C	D	H	N	O	
33	63	78	77	28	38	69	111	24	4	20	51	80	6	34	25	18	
22	63	72	76	26	25		33	10		8	24	41	3	28	17	6	
7		1	1	1	7		7	4			11	3	1		1	3	
1		2		1	3		8			2	6	7			3	3	
2		1			1		9	1	1	3	3	6	1	1		1	
		1			1		6	2			6	3	1	3	1	2	
1		1					10	2		2	1	8			3	1	
					1		6			2		2					
							6					1					
							7	1		1		2		2		1	
							7					3					
							6	2		2						1	
							1										
							3					1					
								1	2								
							1										
%		(1)				68	1		3								
gc (%)	6	0	2	0	1	7	500	42	35	330	32	12	26	13	9	10	24

The natural inference from these facts is that the populations included in this group are products of hybridisation between the “supercilium group” and the “black-headed group”; therefore, the term “intermediary group” is used in the discussion below.

The second conclusion which can be derived from this picture is that the white on the chin and throat is, in fact, an indication of the hybrid character of the population in question. This view is strengthened if we examine the situation in the “supercilium group”. For the nearer the population in question is to a population belonging to the “black-headed group”, the greater is the amount of white colour on the chin and throat, as is easily seen from a comparison between Fig. 4 and Figs. 2 and 3. The only exceptions, the Iberian population and also the “intermediary group” populations of Italy and west Yugoslavia, and Egypt, belong in a class of their own. These populations resemble each other in having much more white on the chin and throat than any other, while there is a clear cline from



FIG. 4. The amount of white on the chin and throat in different dark-headed populations of the Yellow Wagtail (*Motacilla flava*). The circles mark the approximate centres of the seventeen areas on pages 56-57 and the *white* portion of each denotes the average amount of white on the chins and throats of that population, expressed as a percentage of the standard illustrated in Fig. 1 (right) (see also Table 3).

A completely white circle thus represents 100%

west to east in a reduction of the supercilium and at the same time in an increasing amount of black. Every intergrade from the Italian *cinereocapilla* to the completely black-headed *feldegg* is found in west Yugoslavia, and the situation seems to be the same in Albania (Ticehurst and Whistler 1932; see also Sammalisto 1958, p. 40). This strengthens the view already expressed by Williamson (1955) that the Mediterranean populations are a result of hybridisation between the European "supercilium population" and the population of south-east Europe and the Middle East. There is a zone of intergradation between the Iberian population and the "supercilium population" in the south of France (Mayaud 1952), as well as between the populations of Italy and south France on the one hand and Germany on the other (the latter belongs to the area of the "supercilium population") in Switzerland (Schwarz 1956) and obviously also in the extreme south of Germany (G. Diesselhorst orally).

There remains one remarkable population, namely that of the Kalmuck Steppes and the Transcaspian region (*superciliaris*). There

VARIATION IN DARK-HEADED YELLOW WAGTAILS

TABLE 3—THE AMOUNT OF WHITE ON THE CHIN AND THROAT IN DIFFERENT DARK-HEADED POPULATIONS OF THE YELLOW WAGTAIL (*Motacilla flava*)
 amount of white is expressed as a percentage of the standard illustrated in Fig. 1 (*right*) on p. 56. The grouping of the various populations as “supercilium forms”, “black-headed forms” and “intermediary forms” is explained on pages 57-63. The letters A-Q correspond with the areas on pages 56-57 and the *italics* figure immediately under each letter denotes the number of specimens on which the percentages for that area are based.

Supercilium forms						Black-headed forms						Intermediary forms				
A	B	F	G	L	Q	E	I	J	K	M	P	C	D	H	N	O
33	25	80	77	28	39	69	66	23	4	20	51	80	6	32	25	18
	18	18	46	2	9	69	44	17	2	14	25	7		16	13	3
	6	21	12	9	13		11	2	1	3	15	10	1	9	2	2
		16	4	3	7		5	2	1	1	8	7		2	4	4
		4	9	4	4		1			1	2	5		1	4	3
		7	3	1	2		1	1		1		6		2	1	1
	3		4		4						1	4			1	
	1	1	4	1	3		1					3		1		3
	1		1	1			2					6		1		1
	4		4					1				4	1			
	4				2		1					11				
10	13		1									9	3			1
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are only four specimens of it in my material, but they all have much black on the head and a fairly well developed supercilium. It seems obvious that such a population must be the result of hybridisation between the completely black-headed population of the Middle East and the “supercilium population” of Kazakstan (see Williamson 1955). This population is included in the “black-headed group” despite its hybrid character.

DISCUSSION

The picture described above suggests a kind of polymorphic variation in which one extreme has a well-developed supercilium and no black on the head, and the other no supercilium and much black on the head. In other respects, these two extreme forms resemble each other: they have very little or no white on the chin and throat, the length of the hind-claw increases from west to east, and the sexes are more alike in the east than in the west. The offshoot of the “supercilium group”

TABLE 4—THE LENGTH OF THE HIND-CLAW IN DIFFERENT DARK-HEADED POPULATIONS OF THE YELLOW WAGTAIL (*Motacilla flava*)

Measurements are given in millimetres and are accurate to within 0.5 mm. The grouping of the various populations as "supercilium forms", "black-headed forms" and "intermediary forms" is explained on pages 57-63. The letters A-Q correspond with the areas on pages 56-57 and the *italics* figure immediately under each letter denotes the number of specimens on which the percentages for that area are based.

	Supercilium forms						Black-headed forms						Intermediary forms				
	A	B	F	G	L	Q	E	I	J	K	M	P	C	D	H	N	O
	<i>33</i>	<i>60</i>	<i>32</i>	<i>15</i>	<i>13</i>	<i>14</i>	<i>64</i>	<i>105</i>		<i>3</i>	<i>9</i>	<i>17</i>	<i>56</i>	<i>5</i>	<i>29</i>		
6.5	2						I										
7.0	2	4					4	3					I				
7.5	2	3	3		I		5	3					3				
8.0	7	9	3	3	2		13	13					11	2	3		
8.5	5	13	3		2	I	11	17		I	I		11	I	I		
9.0	6	10	10	4	4		13	18		2		I	10	2	5		
9.5	6	10	I	3	2	I	6	22			5	3	8		7		
10.0	2	8	6	3	I	4	7	17			3	I	10		7		
10.5	I		3	I	I	5	3	8				2	2		5		
11.0		3	I	I		2	I	4				4			I		
11.5						I						2					
12.0			2									2					
12.5																	
13.0												I					
13.5												I					
Average (mm.)	8.54	8.85	9.45	9.33	8.92	10.29	8.69	9.15		8.83	9.56	10.94	8.89	8.50	9.57		

No data available

No data available

No data available

leading to the completely white-headed population of outer Mongolia (see page 56) resembles the "black-headed group" in that the head gets paler from west to east.

Between the ranges of these extremes there are areas which are inhabited by populations exhibiting intermediate characteristics in the size of the supercilium and in the amount of black on the head. These populations have an important feature in common in moderate or considerable amounts of white on the chin and throat. The obviously polygenic nature of the variation has resulted in considerable variation in the extreme populations, too, so that there are no really pure populations even among them. On the other hand, as a result of geographical isolation, some clearly intermediate populations (Iberian peninsula and Kazakstan) exhibit no more variation than these "pure" populations, with which they have been included here although the whiteness of chin and throat—among other things—indicates that they are intermediate.

There is nothing paradoxical in the fact that many marginal populations show most white on the chin and throat: in secondary isolation

the hybrid character will easily strengthen. In cases like this where there have been contacts of many kinds between the populations, the exact taxonomic grouping is not as important as the establishment of the tendencies in the variation.

Any suggestion as to the evolutionary history which has led to the present situation is, of course, highly speculative. However, in the light of the interpretation presented above, the following possibility is at least likely. I suggest that the group has evolved from a population in Europe, where a "supercilium form" inhabited the central lowlands and a completely "black-headed form" the mountain regions of the south-east. The latter first extended its range northwards to Fenno-Scandia, and during this expansion came into contact with the "supercilium form". The "supercilium form" was superior to it in the lowlands, but in Fenno-Scandia an "intermediate form" established itself. This "intermediate form" invaded the east, and during the process the coloration of the head got paler and the hind-claw longer. The "supercilium form" of central Europe also expanded eastwards, but diverged into two evolutionary lines at the border between Europe and Asia. One of these invaded north-eastern Asia and crossed the area of the "black-headed form" in the middle of Siberia and Yakutia, during which the hind-claw got longer. The other led to the depigmentation of the head, the extreme link in this series being the white-headed population (*leucocephala*) of outer Mongolia. The secondary contacts between these three lines have produced an immense variability over vast areas.

This interpretation is at variance with the hypotheses put forward by most earlier authors, who implicitly assumed that the expansion in the northern cline took place from east to west, although this does not seem as natural as the expansion in the opposite direction.

As mentioned above, the genetic basis of the variation in the Yellow Wagtail is obviously polygenic, and this is reflected in the exceedingly gradual nature of the variation, especially in the zones of contact between different populations. There are some additional facts which may afford a clue to a genetical interpretation of differences between populations:

(1) One possible explanation of the presence of white on the chin and throat in the "intermediate group" of populations, and its absence in the parental types, the "supercilium group" and the "black-headed group", is a breakage of some genetic system in connection with hybridisation, a system like that found in complex heterozygotes.

(2) I have interpreted the geographical and ecological differences in the variation between the sexes in Fenno-Scandia as due to sex-linked or sex-limited heterosis. In the former case this would mean that many of the factors separating the two parental types from each other

are located in the sex chromosomes. Since in Finland the intermediate males are heterotic but the females not, this theory at least cannot be ruled out, as the female is the heterogametic sex in birds.

(3) Hybridisation has led to different results in different parts of the range of the Yellow Wagtail complex. In Fenno-Scandia the two extreme features, namely the presence of a great amount of black on the head and a well-developed supercilium rarely occur together in the same specimen (*flava* \geq *thunbergi*). In the Kalmuck Steppes, the Transcaspian region (*feldegg* \geq *beema* or *feldegg* \geq *flava* or *feldegg* \geq *zaisanensis*) and Yakutia (*plexa* \geq *simillima*), on the other hand, this phenomenon is not at all rare. These differences might be produced by modifier genes evolved during the course of the adaptation of the different populations to their environments.

(4) In Fenno-Scandia hybridisation has led to a population which is morphologically more or less intermediate, but in south Russia and (not so clearly) in Italy and west Yugoslavia the population is morphologically nearer to one parental type than to the other. This might be due to the effect of modifier genes or to differences in fitness, with the result that the back-cross products of the first generation intermediates with one parental type are superior in fitness to the back-cross products with the other parental type and to the first generation hybrids.

(5) As mentioned earlier in this paper, no complete agreement has been achieved among authors on whether the yellow-headed forms constitute a separate species. Hybrids between the dark-headed forms and the yellow-headed ones have been identified both among skins in museum collections and in the field (e.g. Sammalisto 1958 and Milne 1959).

I have tried to study the influence of the yellow-heads on the variation in the dark-heads by taking into account the amount of green feathers on the head (the colour of the head of the yellow-heads varies from dark green to bright yellow) and by the presence of yellow in the supercilium (which is always yellow in the yellow-heads), but these features occur so rarely in the dark-headed forms that it is not possible from my data to detect any differences between populations in these respects. This indicates that the exchange of genes between the dark-heads and the yellow-heads is not very effective and that one is justified in treating the variation in these two groups separately.

A final clarification of the Yellow Wagtail problem can certainly be arrived at only by intensive field studies. As it appears possible to link the genetical, ecological and perhaps also the cytological aspects of the problem, the results of such a study might be of value to systematics and population genetics. For instance, it would be interesting to ascertain whether there are differences between marginal

and central populations comparable to those discovered by Carson (1955) in fruit flies (*Drosophila*). He found that marginal populations have free crossing-over and are capable of further evolution, "whereas central populations with a high degree of chromosomal polymorphism suffer drastic reduction in ability to undergo recombination by crossing over." Dobzhansky (1955) particularly stressed the importance of chromosomal polymorphism in the adaptation of *Drosophila*, and so did Carson, but it is the latter's primary contribution that populations with free recombination, be they marginal or not (there can be species in which all populations are "marginal" in this sense), are evolutionary centres since the possibilities of creating new genotypes are not restricted by chromosomal polymorphism. Some of the facts presented above can perhaps be interpreted as due to chromosomal polymorphism, and it would certainly be fruitful to compare the evolutionary pattern in animals as remote from each other as the Yellow Wagtail and *Drosophila*. First of all, the genetic basis of the head-colour should be clarified. This would be possible only by far more extensive colour-ringing than has been done so far, as young birds in general only rarely settle themselves in the vicinity of their birth-place in their second year. The cytological aspect would also be difficult to study. All aspects of the work would demand help from many amateur ornithologists, and also an effective co-operation of scientists in both East and West.

ACKNOWLEDGEMENTS

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SUMMARY

(1) Geographical variation in the dark-headed forms of the Yellow Wagtail (*Motacilla flava*) was studied by the analysis of four variables: the length of the supercilium, the amount of black on the head, the amount of white on the chin and throat, and the length of the hind-claw.

(2) The populations could be separated into three groups: (a) those with a well-developed supercilium and very little black on the head (if any); (b) those with the

supercilium lacking or reduced and much black on the head; and (c) those intermediate in both supercilium and amount of black on the head.

(3) The area occupied by this third group lies between the areas of the two. A characteristic of the intermediate population is the presence of moderate or considerable amounts of white on the chin and throat, whereas this characteristic is lacking, or almost so, in the other two groups.

(4) It is suggested that the first two groups are the parental types and the third their hybrid forms. As the basis of the variation is obviously polygenic and isolation is not complete, there are practically no pure populations and over vast areas the variation is considerable.

(5) Speculations are advanced concerning the evolutionary history of the group and the nature of the genetical differences between the populations.

GLOSSARY OF GENETIC TERMS

alleles: different genes occupying the same relative positions in corresponding chromosomes

back-cross: crossing of a hybrid with one of that hybrid's parental stocks

chromosomes: permanent structures in the cell nucleus carrying the genes in linear arrangement

crossing-over: interchange of genes between chromosome pairs

cytology: study of the structure and activities of cells

genes: units of heredity capable of reproduction and mutation

genotype: genetic constitution of an individual

heterogametic: applied to the sex in which there are both male- and female-producing (X and Y) gametes or reproductive cells (in mammals and most insects this is the male, in birds the female)

heterosis (adjective *heterotic*): hybrid vigour, by which hybrids possess a selective advantage against their parental forms.

heterozygote: offspring of dissimilar parents which produces different types of young

modifier: gene which induces an alteration of a particular mutant effect

polygenic: determined by many genetic factors

polymorphism: occurrence of different forms in one species

recombination: formation in offspring of combinations of genes not present in either parent

sex-limited: gene expressed in only one sex

sex-linked: gene or character connected with one sex

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Some photographic studies of the Nightjar

*Photographs by John Markham, Ronald Thompson, C. R. Brown,
Eric Hosking and M. S. Wood*

(Plates 10-17)

IN GENERAL WE TRY to publish photographs for their biological interest or because they illustrate points of identification, rather than for their aesthetic value. This aim is always borne in mind in the selection and presentation of the photographs in our series "Studies of less familiar birds", but we are more than prepared to interrupt this series with sets of photographs of species that nest commonly in Britain and Ireland when we receive prints which are unusual or have something new and interesting to show. These photographs of the Nightjar (*Caprimulgus europaeus*) include some in both these categories.

In this set there are two photographs that seem of outstanding interest. Plate 11 shows a female Nightjar perched on a dead stump which was about ten yards from her nest in Kinmel Park, just on the Flintshire side of the county boundary with Denbighshire; the male is immediately overhead and apparently braking, judging from the widely spread and depressed tail and the forward-curved wings.

As this photograph was taken at night by flash, so that Ronald Thompson was alternately dazzled by the light or unable to see because of the darkness, it is impossible for him to say exactly what was happening. The birds may have been about to copulate, but he considers this unlikely. The female was in the habit of flying to this stump in daylight when disturbed from the nest. At night both birds used it as a perch. On the night in question he knew that a Nightjar was on the stump and he could just discern the male flying round and calling softly. He suggests that both birds were rather puzzled by the flashes and that there is possibly no special significance in this photograph. It may simply be that he released his shutter just as the male was coming near to the female. There were small young in the nest at the time (plate 10), but this perhaps does not entirely preclude the first suggestion since Nightjars sometimes start their second broods when the young of the first brood are as little as ten days old, though more usually when they are about 13 days old and up to about 17, the male taking them over while the female lays and incubates again (the young start to fly at 14-18 days and become independent at between four and five weeks). Incidentally, this particular photograph unfortunately became slightly fogged before it was developed, probably as a result of the slide being taken out of its case in strong sunlight, and this is the reason for the slightly ethereal effect.

The Handbook states that the Nightjar "normally perches lengthways on branches, resting on breast, but will exceptionally perch across branch; also, with body more slanting, on bush, stump, or . . . tip of young conifer, etc., or on outer twigs on top of larger tree". It also states that the song is "delivered with closed bill". These two statements are still generally accepted and therefore the photograph on plate 13 is of special interest. John Markham took it at about 10 p.m. on 9th July 1960 at Minsmere, Suffolk. This male Nightjar had been in the habit of singing from this post for the previous five or six weeks. Whenever it alighted on the post it used to start churring immediately while still standing on its short legs and tiny feet. After about 20 or 30 seconds it would either gradually lower itself on to its belly, without a pause in its song, or leap into the air to chase a neighbouring male with which it was having a lot of trouble. On the occasion when the photograph was taken it began to churr immediately on alighting, as usual, and Mr. Markham waited for about ten seconds for the song to gain its full strength before he released the shutter. His reason for waiting was that he had long suspected, from the nature of the sound, that sometimes Nightjars sing with the mandibles slightly parted, and this certainly appears to be the case in this photograph. The inset on plate 13, which was taken four years earlier at Walberswick in the same county, shows another male



PLATE 10. Pair of Nightjars (*Caprimulgus europaeus*) changing over at nest, Flintshire, June 1950. The male often covers the eggs when the female feeds and both brood the young; tiny chicks can just be seen here (*bottom right*). Note the white-spotted wings and tail of the male (pages 69-71) (*photo: Ronald Thompson*)

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PLATE 11. Male Nightjar (*Caprimulgus europaeus*) braking above perched female, Flintshire, June 1950. These birds may have been about to copulate or were perhaps puzzled by the firing of the flashes (page 70) (photo: Ronald Thompson)

PLATE 12. These illustrate the completeness of the bird's camouflage, the effect being lessened when it opens its eyes. In feeding (bottom) the parent puts its beak into the chick's gape (photos: Eric Hosking and, centre, M. S. Wood)







PLATE 14. Male in flight, Flintshire, June 1950, illustrating white wing and tail markings (cf. plate 17), large eye, and small bill and legs (photo: Ronald Thompson)

PLATE 13. Male Nightjar (*Caprimulgus europaeus*) churring on stump, Suffolk, 1960. Note the slightly open bill and the even more surprising fact that the bird is standing, not resting lengthways along a branch (page 70). Inset, male churring from a high upright tree, Suffolk, July 1956 (photos: John Markham)



PLATE 15. Male Nightjar (*Caprimulgus europaeus*) brooding young on marram dunes, Lancashire, 1912. Taken, surprisingly, nearly 50 years ago, this shows a less familiar habitat (though Nightjars will also nest on shingly beaches). The egg-shells are left lying and the chicks soon start moving off (photo: C. R. Brown)

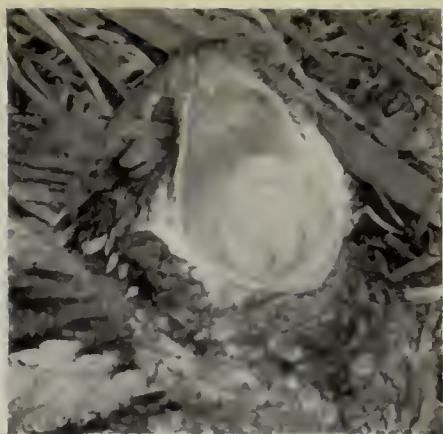


PLATE 16. Left, Nightjar (*Caprimulgus europaeus*) yawning, showing the enormous extent of the open gape compared with the small bill (*photo: Eric Hosking*). Below, female and young, Suffolk, July 1956: an unusual front view illustrating the broad flat head, the row of long and very stiff bristles directed forwards and outwards along the edge of the upper mandible, and again the remarkable camouflauge of the protective plumage (*photo: John Markham*)





PLATE 17. Female Nightjar (*Caprimulgus europaeus*) fluttering away over bracken, Suffolk, July 1960. This delightful and unusual view from above and behind well illustrates the lack of white spots on the outer primaries and outer tail-feathers of the female (cf. plates 10-11, 14-15) (photo: John Markham)

balanced precariously on one of five very similar song posts that it was in the habit of using regularly. This bird had no need to choose such awkward perches, for its territory contained scores of trees with horizontal dead boughs at almost the same height. Another male, also in 1956, which Mr. Markham frequently saw using a horizontal bough every evening, nearly always alighted crosswise or at an angle of 45° and sang for a minute or so in that position before arranging itself along the bough. Thus it seems that Nightjars vary individually in their singing behaviour more than is generally supposed. Incidentally, at another site in 1960 Mr. Markham saw the female alight near the lower end of a sloping dead bough and then walk carefully, just like a pigeon, up to the top before it gently lowered its body and relaxed.

Two other pictures in this set which also seem especially striking to us are those on plates 10 and 17, by the same two photographers. Ronald Thompson's photograph of a change-over at the nest (plate 10), the male coming in to land and passing in front of the female as the latter takes off, is most delightful and very interesting, while John Markham's shot of a female fluttering away over the bracken makes a most unusual and arresting study. Incidentally, a comparison between this plate and any of those of males in flight (plates 11, 14 and 15) brings out the differences between the wing and tail markings of the two sexes, as also does plate 10.

The shape of the Nightjar's broad flat head is well shown in plates 15 and 16b, while in the latter one can just see the line of long and very stiff bristles along the edge of the upper mandible. It is also interesting to compare the tiny beak as it appears in most of these photographs (particularly plates 13 and 14) with the huge gape that is revealed on plate 16a as the bird yawns. The Nightjar of course catches its insect food in flight and such a gape is necessary to secure the moths and beetles which form nine-tenths of its prey. Plate 12c illustrates how the beaks of adult and young are arranged as the parent passes food to its chick, and a comparison of plates 12a and 12b with this one demonstrates the way in which the closed eye aids the camouflage of the sitting bird. Some of the differences in habitat are also brought out here: nest-sites vary from fairly overgrown wood edges (plate 10) to open commons (plate 12) and, less familiar, marram-covered sand-dunes (plate 15) and even shingle.

In conclusion, one cannot refrain from drawing attention to the fact that C. R. Brown's photograph on plate 15 was taken almost 50 years ago and yet holds its own surprisingly well with all the others.

I. J. FERGUSON-LEES

Notes

Ring-necked Duck in Co. Armagh.—A male Ring-necked Duck (*Aythya collaris*) stayed on the lake in the Public Park, Lurgan, Co. Armagh, from 20th March till 1st May 1960 and was seen on many occasions by various observers. It then disappeared, but returned on 25th September and was seen either there or on the shore of Lough Neagh till at least 1st January 1961.

The bird was originally found late in the afternoon on 20th March by R. W. Culbert who took field notes in the fading light. During the following week he contacted S. Penney who at once identified it from the description. Subsequently, it was seen almost every week-end although it was seldom, if ever, present on Saturdays owing to the activities of speed-boat enthusiasts. It was usually in the company of a small flock of Tufted Ducks (*A. fuligula*)—as it was when first discovered—and it mostly appeared to be asleep. It was invariably the first to make its way out to the middle of the lake, still apparently asleep, at the approach of people. It was always easy to pick out from its companions by its very striking grey and white side-patch and by its habit of keeping its tail almost permanently cocked. When alarmed, it stretched out its neck and then its very distinctive head-shape and pied bill were extremely obvious. On 10th April the bird was watched over a long period by W. Finley, I. C. McDonald, C. Watson, R.W.C., T.E. and S.P. and it was then that the main field notes for the following description were taken:

Head and neck black, the latter with an obscure brown ring round the base (this was seen clearly only on one occasion by R.W.C.). Breast, upper-parts, tail and under tail-coverts also black; no light edging was noticed on the tail (*cf. Brit. Birds*, 52: 430). Flanks mostly a soft mid-grey but with the anterior portion a clean white which extended up the sides of the breast in a contrasting crescent; the hind portion of the side panel tapered off more than in a Tufted Duck and the panel itself seemed to extend over a greater area, so that the black of the back was noticeably less extensive than the black in a Tufted Duck. Bill noticeably larger than a Tufted Duck's and metallic grey with two conspicuous white rings round it, one at the base and one just behind the dark tip. Eyes always appeared deep orange or orange-red. Build similar to Tufted Duck, although on occasion it appeared somewhat heavier. Head shape most distinctive: no tuft, but instead a noticeable "knob" on the back of the head, giving a conical or peaked effect.

A few attempts were made at photography, but even with long-range lenses the wariness of the bird made it impossible to obtain good results.

When it returned to the park in the autumn it was first seen by L. Kersley and R.W.C. on 25th September. It then seemed to be in the remains of eclipse plumage and there appeared to be little contrast

between the crescent and the remainder of the side panel. R.W.C. saw it again on 9th and 30th October, and 20th November. By the last date it was in plumage similar to that in March and April. On 4th December it was seen with Tufted Ducks two miles north of Lurgan, on the south shore of Lough Neagh at Kinnego Harbour. By 25th December it had returned to the Park (when it was seen to throw its head back in display on one occasion) and it was last observed there on 1st January 1961 by R.W.C., W.F. and S.P. THOMAS ENNIS

Red-flanked Bluetail in Northumberland.—On 16th October 1960, at Hartley, Northumberland, B.G. and D.T.P. saw a bird which later proved to be a female Red-flanked Bluetail (*Tarsiger cyanurus*). This was at 2 p.m.; they telephoned D.H. and he arrived an hour later. The three of us then watched the bird until about 4.30 p.m., by which time it was becoming dusk. The following description was obtained mainly from a distance of 10-15 yards with telescopes in good light and sunshine, but the bird was also seen as close as five feet:

Nape and crown olive-green (also one or two bluish feathers on latter which were sometimes ruffled up to give an almost half-crested appearance). Superciliary and eye-ring cream. Throat and chin cream. Ear-coverts, sides of throat and narrow band across breast all dirty grey. Flanks orange; belly creamy-grey; under tail-coverts white. Back, scapulars and secondaries olive-green; primaries chestnut. Small black mark, with narrow cream stripe immediately below it, on front edge of folded wing and thin black line on rear edge (but none of these markings showed in flight). Tail rounded and metallic blue, darker in centre and at tip, blue extending on to rump. Eye black; bill black; legs long and black.

About 20 yards from the cliff edge at Hartley there is a disused army shooting butt with brambles growing down the inland side. It was in these brambles that the bird was first seen and subsequently spent much of its time. It was tired and consequently allowed a close approach, especially in the first hour when it slept a lot. It was also seen on an adjacent fence, as well as in short flights. When feeding it hopped on the ground and appeared to be catching grasshoppers, but it also once attempted to take an insect on the wing after the manner of a flycatcher. In general appearance and movements it resembled a Redstart (*Phoenicurus phoenicurus*), although it appeared slightly smaller and had a more upright stance (quite apart from being distinctively plumaged). Its call-note *tick-tick* was also reminiscent of that of a Redstart, but harsher.

B. GALLOWAY, D. HOWEY and D. T. PARKIN

Pallas's Warbler in Essex.—On 16th October 1960, at Walton-on-the-Naze, Essex, we found a very small warbler which we at first took to be a Yellow-browed Warbler (*Phylloscopus inornatus*), but

which later proved to be a Pallas's Warbler (*Pb. proregulus*). The bird was found in a clump of tamarisk bushes on the shore and was under observation from 12.50 to 5.15 p.m. We made several attempts to catch it in a mist-net, but it continually passed through the mesh. However, we were able to take the following detailed description:

Size as Goldcrest (*Regulus regulus*). Crown and nape dull green. Broad, very bright yellow stripe over eye, extending from bill on to side of nape; slightly paler yellow crown-stripe from forehead to nape, a little narrower than the superciliary, but broadening considerably on nape and edges becoming less sharply defined; dark line from bill through eye, underlining the superciliary. Cheeks dirty yellow. Rest of upper-parts, except rump, clean bright green, brighter than in Firecrest (*R. ignicapillus*). Rump bright greenish-yellow, appearing yellow except at very close range and contrasting markedly with rest of upper-parts, sharply defined and not shading into green of back. Wings slightly darker than back, but still bright green and with yellow sheen on secondaries; tips to median and greater wing-coverts yellow, forming conspicuous bars (much more marked on greater coverts). Tail dark, rather short. Under-parts generally whitish, but throat and breast dingy, and flanks and under tail-coverts yellow. Bill and legs brownish.

Our initial impression as the bird flitted away from us was of a yellow-rumped Firecrest. The most striking features at any distance were the very long and bright yellow superciliary, the yellow wing-bars and, especially when it was hovering, the yellowish rump. It was tremendously active, more so than any other bird we had seen. The whole time it was under observation it was moving and continually feeding with actions reminiscent of a Goldcrest, but much more dynamic. It fed both in the tops and bottoms of the bushes, but seemed to prefer the lower branches. There it flitted from twig to twig, frequently hovering to pick at the tip of one or at the underside of a spray of leaves and, on occasions, hanging upside down to do this.

R. B. CLARKE, M. COATH, R. J. JOHNS and D. B. D. JONES

Reviews

Våra Fåglar i Norden (Our Birds in the North). Second edition edited by Kai Curry-Lindahl (Swedish text). Bokförlaget Natur och Cultur, Stockholm, 1959 and 1960. Volumes I and II, 1022 pages; coloured and black-and-white plates, and maps. (Four volumes: Sw. Kr. 430.)

Though *Våra Fåglar i Norden* first appeared only thirteen years ago, there is already need for its revision, and in particular for the incorporation of the mass of fresh material which has since accumulated. This has been undertaken by the secretary to the editors responsible

for the original text, Dr. Kai Curry-Lindahl. To conform to modern practice, he has adopted the Wetmore system in place of that of Hartert—perhaps the greatest single difference between the two editions. Precedence is again given to birds on the Swedish list over those not recorded from that country though known to occur in Denmark, Norway or Finland, and the latter are relegated to the concluding section of the work. Thanks to careful editing, the whole will be completed in four volumes. Besides giving an account of avian morphology and biology, and a brief but most interesting review of the study of migration at Swedish observatories, the two volumes now published deal with 126 of the birds found every year in Sweden, including breeding species, passage migrants, marine species such as the Fulmar and Gannet, and several introduced forms. Each of these is the subject of a “popular-scientific” (“popularvetenskapliga”) account written by a naturalist acquainted with it in the field and largely based on his personal experience. Where no fewer than 22 writers are concerned, it is hardly surprising to find their contributions differing in style as well as in length. In some the tendency is more towards the popular and anecdotal approach, the field-characteristics of the Dotterel being presented in the form of a telephone conversation with a novice! But all make pleasant reading and contain a wealth of information on habits, behaviour, breeding biology, and ecology.

Space unfortunately does not allow of more than occasional quotation from these essays. Swedish and Finnish observers have discovered that while some Goldeneye ducklings jump from the nest, others are carried in their parents' bills. A Red-breasted Merganser will drive away another and adopt her brood. The northern race of the Buzzard, *vulpinus*, is described as differing from the nominate form in its preference for swampy woods and in lining its nest with witch-hair lichen (*Usnea*). The prey brought to a Swedish Black Kite's nest included a Red Squirrel, a thrush, a Mallard, a Tufted Duck and two Curlews; and the remains of a Crane were found in one White-tailed Eagle's eyrie. Mink have become a serious menace to harriers and other marsh birds in some localities. Excellent accounts, based on original field-notes, are given of the lekking of the Great Snipe and the hilling of the Ruff, and attention is drawn to the little-known displays of the female Dotterel in which as many as six or more birds take part. The question whether the Woodcock lays two clutches in Sweden—as the Common Snipe regularly does—is discussed at length. Curry-Lindahl appears dissatisfied with much of the evidence in support of claims that the Woodcock carries its young, pointing out that two Swedish observers who have ringed many broods have yet to see this happen. The small Arctic race of the Ringed Plover, *tundræ*, becomes a highland form in parts of its

Swedish range, nesting on lichen-grown, tundra-like fells. As in Great Britain, the Little Ringed Plover prefers gravel-pits and the like, often far inland. Another bird to take advantage of the workings of Man is, surprisingly enough, the Osprey, which in some places builds on pylons. The histories of some migrants—such as the Black Kite and several waders—are extended to cover their winter-quarters. Some writers have included in their scope old historical records and traditions. Curry-Lindahl comments on the appalling slaughter of Herons in the palmy days of falconry, and tells us that at one time the Black Stork was generally known in Sweden as “Odin’s Swallow” (“Odens svala”), a name recalling the awe in which the bird was held in pagan mythology and still perpetuated in certain place-names.

If these essays call for any general criticism it is that Norwegian and Finnish sources might have been more frequently and more extensively quoted. For example, one must look to the editor’s supplementary notes for any reference to the breeding of the Fulmar, Gannet and Smew in Norway, and the account of the White-tailed Eagle might have gained by the inclusion of data from its strongholds along the Norwegian coast. Again, beyond a few lines on Landmark’s observations on the Little Stint’s tameness at the nest, no use has been made of the many excellent records of the breeding of that wader in Finmark.

The more general essays are supplemented by notes in smaller print, and more concisely written, on plumage, voice, general distribution, status in Sweden, breeding, migration and hybrids. The reader is given not only the present-day Swedish range of each species in full, but a detailed history of local changes in its status, the two together sometimes covering as much as four or five pages. That many birds have lost ground in the course of the century is hardly surprising. No White Storks have been reared on Swedish soil since 1943, climatic changes being no doubt partly responsible for the loss of these handsome birds. With the ceaseless encroachment of agriculture and, latterly, industry upon marshes and heaths, such birds as the Bean Goose, the Golden Plover and the Wood Sandpiper—to name but three—have disappeared from many of their haunts. Sportsmen and “pot-hunters” have reduced the numbers of others to dangerously low levels. Wholesale butchery of moulting birds in the summer finally exterminated the Grey Lag Goose on one marsh in Småland and had made alarming inroads on the Bean Goose population further north.

Overshooting is also regarded as the principal cause of the general deterioration in the Great Snipe’s status. A century ago this wader was still considered to be reasonably common in southern and central Sweden. Even then, however, it had already begun to lose ground. In one district a sportsman would be lucky to see twenty or thirty birds

in the course of a day spent on a marsh where, thirty years before, ten times as many could be flushed. Today Great Snipe are such rarities over much of central and southern Sweden that it is quite an event for one to be identified and the last twenty years have yielded a bare half-dozen records. From the more northerly provinces comes a like tale of increasing scarcity and deserted breeding-stations; but a few pairs contrive to maintain a footing in certain favoured localities, particularly in Jamtland. Curry-Lindahl admits that recent changes in the Swedish climate must be taken into account, but it is apparently generally agreed that the excessive toll taken by sportsmen could alone have brought this interesting bird to near-extinction in Scandinavia. We read of 136 head falling to a lone gunner on one marsh in three days and—worse still—of sixty males snared at a lek in the course of a night! It is hardly surprising that the Great Snipe is now a far rarer visitor to Britain and Ireland than *The Handbook* suggests.

Nevertheless, in spite of these sad declines, the picture as a whole is not entirely discouraging. Some species banished earlier in the century have succeeded in gaining a fresh footing, amongst them the Bittern and the Avocet. Others that were at one time perilously near extinction have recovered and the Marsh Harrier, Kite and Osprey in particular have all benefited by the protection now extended to birds of prey. The imposing group of birds which are now more numerous and more widely distributed includes the Black-throated Diver, the grebes, several ducks, the Water Rail and the Spotted Crane, the Woodcock and the Partridge, the last recently reported as far north as Tornea. Finally, Sweden has gained several species within the last few decades, and three of these—the Black-necked Grebe, the Montagu's Harrier and the Black Kite—appear in the volumes under review. The Black Kite now seems to have established itself in Norbotten, about 900 miles to the north of its only other Swedish breeding station. The Red-footed Falcon has bred once, in Öland. A Barnacle Goose seen with two young in Harjedalen in 1952 had probably escaped from captivity somewhere, even if it was not a straggler from Tayfield.

Where a species is represented by more than one race, the distribution of each is carefully traced, as well as the area in which intermediate forms are to be found. The ranges of the two races of the Buzzard overlap and interbreeding occurs. *B. vulgaris* predominates from Värmland northwards, but *B. buteo* has been found nesting in Pitea lappmark. In Norrland some breeding Goshawks have been identified as examples of the race *buteoides*, which perhaps replaces *nilis* in Tornea and north-east Norbotten. Capercaillie from the south of Sweden are referred to Brehm's race, *major*, and those from the north to the nominate form, the forests for more than 200 miles—

from 60°N to 64°N—being inhabited by nondescripts. It is the nominate race of the Hazel Hen which is found in Sweden except in the extreme south, where birds approaching the central European *rupestris* are common, and in the north, where some resemble the paler, greyer *sibiricus*. The southern race of the Golden Plover breeds over a wide area with its northern limits through Dalsund, Västergötland, Småland, Öland and Gotland. Of the two races of the Dunlin, *schinzii* replaces *alpina* from Värmland southwards, but birds referable to neither have been obtained in Lapland.

Notes on the status of the different species elsewhere in Scandinavia appear in the short paragraphs on general distribution and, considering the book's title, seem disappointingly brief in some cases. Recent Norwegian records of the tundra form of the Peregrine, *caeruliceps*, are entirely passed over, although one of these referred to a breeding bird. Much of interest is to be found in the well-written sections on breeding biology, however, though here again one regrets the failure to make fuller use of Finnish and Norwegian material in some. No account is given of the nesting of the Brent Goose in Spitsbergen, for example. Norwegian and Finnish records have not, however, been overlooked in the preparation of the very full paragraphs on migration, which students of that subject will find invaluable.

Apart from the excellent outline maps supplementing the paragraphs on distribution and migration, and a well-executed painting of ducks' specula, *Våra Fåglar i Norden* is illustrated entirely by photography. Unfortunately, with only one or two exceptions, the colour plates have been taken from mounted specimens. Taxidermy, however skilful, has its limitations, and these the camera will always reveal. A faded specimen appears to have been chosen for the plate of the Kite, and the colouring of that of the Kentish Plover is misleading. With some species only the adult male is figured in colour, and in one—the Montagu's Harrier—only the adult female. Many of the numerous black-and-white illustrations, on the other hand, cannot be too highly commended. Some, such as that of a Great-crested Grebe feeding its chick with a feather, show rarely-observed habits. Amongst those of exceptional merit as examples of the photographer's art may be mentioned the fine series of the White-tailed Eagle, some of those of waders in flight, those of a Green Sandpiper incubating on a stump, and the two of a Wood Sandpiper with its eggs in a Fieldfare's nest. It would be interesting to know how the grim sequence of a Golden Eagle attacking and killing a fox came to be taken.

H. M. S. BLAIR

Evolution above the Species Level. By Bernhard Rensch. Columbia University Press and Methuen, London, 1959. xvii + 419 pages; 113 text-figures. (Original German edition 1947, second edition 1954). 63s.

This substantial volume does not contain much of interest to the ornithologist, but it is a "must" for all serious students of evolution. The amateur will not find it easy, partly because the discussions are sometimes handled in a rather abstract manner, partly because the English is not always good. The intention of the book is to show that "very probably the major trends of evolution are brought about by the same factors that bring about race and species formation." This conclusion has been reached already by various authors (e.g. Mayr) in Britain and America and is generally accepted. Apparently in Germany there are still enough people who postulate superior and unique guiding principles of evolution to make a full-length treatment of the subject necessary. What saves this book from being only a recapitulation is the excellent account of Professor Rensch's own work on evolutionary trends in genera, families and other groups above the species; this makes up the greater part of the book, and is an important contribution to the study of evolution.

The first three chapters are a survey of evolution up to the species level, i.e., of how populations become recognisably different, both geographically and in the course of time in a single evolutionary line. It is the least satisfactory part of the book, being both too abstract and too superficially documented. Less general assertion and the use of a few thoroughly-discussed examples would have given a clearer impression of the subject. Then a chapter is devoted to refuting ideas of orthogenesis, as has been done already by G. G. Simpson in, for example, his excellent little book *The Meaning of Evolution* (Mentor Books 1951). The important conclusion is reached that the demands of living in a particular way, in a particular niche, are what usually govern the evolutionary direction taken by a particular sort of organism. Professor Rensch's vivid awareness of the importance of ecology gives to his discussions a welcome and wholesome flavour not to be found in the works of many other evolutionists. The remainder of the book deals with adaptive radiation (the splitting of a stock into different sorts adapted for different modes of life) with special reference to the effects of allometric growth—the production of horns, spines, tail-feathers and other appendages of quite disproportionate length by means of a slight increase in body size. Then parallel evolution and convergence are discussed, the evolution of new types of structure, and lastly the evolution of consciousness.

A. J. CAIN

Letters

The Len Howard Appeal

Sirs—All readers of Miss Len Howard's books *Birds as Individuals* and *Living with Birds* have been distressed to learn that her life's work is threatened by building on the land next to her garden sanctuary. For twenty-one years Miss Howard has studied the birds, and especially the Great and Blue Tits, of her garden at Bird Cottage, Ditchling, under the South Downs a little north of Brighton. Her own garden, however, is so small, only 20 yards wide, that its value as a sanctuary and place where her fascinating observations can be made depends on the surrounding land being undisturbed.

Already one neighbouring plot has been built on, to the grave detriment of Miss Howard's work, and now another adjacent plot, an old orchard of great importance as territory for her birds, is threatened. It is proposed that this plot should be purchased and vested in trustees in order to safeguard permanently Miss Howard's work.

We appeal for £7,500 to enable this to be done, and to provide a sufficient margin for emergencies and for future maintenance of the property. Will you please help by sending a donation to "The Len Howard Appeal", c/o Westminster Bank Ltd., Horsham, Sussex?

ALAN BROOKE	TUFTON BEAMISH
JULIAN HUXLEY	R. S. R. FITTER
JAMES FISHER	D. B. MAYNARD

(Hon. Secretary)

"The Helsinki Congress and the future"

[A number of valuable comments have been received from leading ornithologists at home and abroad on the problems concerning international ornithological congresses, which were raised in a special review in our October issue under the above title (*Brit. Birds*, 53: 447-452). Some of these were not meant for publication; the remainder, in some cases slightly abridged, are printed below in alphabetical order. Hardly any of the opinions received are substantially critical of or opposed to the line adopted in the review. In fact, it is striking to note how many have felt that the doubts and questions expressed there merely recapitulate their own reactions. While it would clearly be inappropriate for those responsible for the planning of the next congress to express their views in print, we are glad to know that the public ventilation of these problems at this stage is regarded as helpful and illuminating, in so far as it enables all

concerned to appreciate the dilemmas with which the organisers of each of these congresses find themselves faced. The response has in itself contributed towards a solution of the problems by showing how seriously and constructively responsible ornithologists view them, and this, it seems, is as much as can be expected of a journal. We do not therefore propose to pursue the matter further ourselves, but any help we can suitably give is at the disposal of the national and international bodies concerned.—E.M.N.]

Sirs,—I consider this a timely drawing of attention to a seriously thought-provoking situation. Many of the questions posed by the reviewer faithfully echo my own thoughts while the Helsinki Congress was on. I also entirely agree with the observation about the steeply varying quality of the papers read at that congress, some of which now, in cold print, are even less impressive.

It is patently unfair to the host country, as well as to the more serious type of participant, who has often travelled long and expensive distances, to get mixed up in the sort of unwieldy ornithological hotch-potch—*tamasha* as we call it in India—that we had in Helsinki. A tendency that is also deplorably on the increase in India is for “scientists” to elbow themselves into being nominated by government or private institutions as delegates to scientific conferences, e.g. to our most important annual Indian Science Congress, and then after the fanfare of the opening session, usually more of a social affair, to spend most of the congress week in sight-seeing and shopping, leaving an attenuated quorum of listeners and a good many empty chairs to greet the papers of eminent scientists who have been specially invited from abroad, often at considerable sacrifice to themselves and great expense to the country! This seems to be a real and growing scandal in many places, and I am glad your reviewer refers to it so feelingly.

By and large I am—as I am sure many will be—in agreement with all the criticisms of the reviewer, but having given some thought to the matter I am afraid I cannot think of any constructive or workable remedy to suggest at the moment. Undoubtedly some form of strict equality and quantity control is essential, both in regard to the participants and the papers given, in order to uphold and safeguard the dignity and scientific status of these international ornithological congresses. Yet I feel that the attendance should not be so severely pruned that seriously inclined “amateurs”—the borderline cases—are deprived of the opportunity of listening to, and occasionally even participating in, discussions on various topics of scientific ornithology, and of drawing inspiration from eminent workers. Our endeavour should be to strike the golden mean; how this can be achieved must be carefully considered.

One thing I strongly feel to be highly desirable, and which I have discussed with several of my co-members of the International Ornithological Committee, is that more time should be allowed for discussion after each paper than is available under the present arrangement. I believe that within the time allotted to each author, it would be far more profitable for everybody if instead of reading out his paper in full—sometimes indifferently or indistinctly, and often stuffed to boredom with statistics and minutiae—the author restricted himself merely to giving a terse summary of it, highlighting the points he particularly wishes to make. In the ensuing discussion he could then elaborate them if necessary by reading out relevant passages from his paper. I feel that in this way not only could time be saved but even the non-specialist in a specialised topic would get the benefit of acquainting himself with the background and keeping himself abreast of many aspects of the science which lie outside his special branch of work or interest. The paper would later be published in the *Proceedings* anyhow, and it would then perhaps be much more meaningful for one who had followed the discussion.

SALIM ALI

Sirs,—Mr. Nicholson's view that the ornithological congresses must be organised in another way than hitherto is certainly sound and, I think, emphasises a necessity. In my opinion symposia on limited subjects and with selected speakers is the only way for the future. In addition, there should always be some "open topic" for papers that cannot be placed within the given subjects, but in this case also a selection is necessary.

In discussions following the lectures of the invited speakers all members of the congress would, of course, have the right to take part. In connection with any such open discussion, however, it is important that the chairman is the right man in relation to the topic dealt with, so that he can manage the discussion at a high level. The power of the chairman to interrupt, or even to exclude speakers deviating too far from the main subject or apparently being unqualified to give comments, must be recognised and respected by all members in the interest of the congress. It is certainly a delicate task for a chairman to handle meetings crowded with people with a very varying ornithological approach. If such a hard policy were used throughout a couple of congresses, then the result would probably be a kind of natural selection in favour of serious congress participants and an elimination of "speaking passengers".

The most valuable thing about ornithological congresses seems to me to be the personal contacts in small, privately organised discussions behind the scenes. There were several successful minor meetings of this kind on very limited subjects both in Helsinki and in London in

1958. The yield of such gatherings is often greater than that of the official sessions, a fact that indicates a new deal for future congresses.

The problem of excursions is difficult, but there is always the possibility of cutting down the number of participants for reasons of organisation and even of conservation (habitats, nests and nestlings are often destroyed when an invasion of congress ornithologists has passed) or of dividing people into different groups, for example pure ornithologists and "hangers on".

The best season for an ornithological congress connected with field excursions in the northern part of the northern hemisphere seems to be during the birds' breeding period, when the avifauna is the richest and the habitats are the most representative.

Much more could be said about the questions raised by Mr. Nicholson. These problems deserve thorough thoughts and planning. Why not take them up for discussion at an open meeting in Ithaca in 1962?

KAI CURRY-LINDAHL

Sirs,—I entirely agree with the criticism of ornithological congresses, though, as one of the older ornithologists who did not make the trip to Helsinki, I have no personal comments to make on that meeting. The trouble with recent congresses has been that they have been attended by too many people, many of whom have been mere amateurs. They have also tended to last too long. A good remedy would be drastic curtailment of excursions and severe organisation of the meetings. The International Council for Bird Preservation has, since 1934, held meetings before every congress, in order to replace a previous cumbersome section on bird protection, but these have developed into complete congresses of their own and it is now proposed not to hold them then. This would make the session lighter for many of us. I am, however, in favour of congresses: they have the tremendous advantage of enabling ornithologists from different countries to meet, and this is their main purpose. But steps should be taken to reserve space and time for serious workers only.

J. DELACOUR

Sirs,—The review by E. M. Nicholson on the subject of international ornithological congresses appears to me to be very important and significant. That is why I am now taking the liberty of putting forward several quite personal opinions. It will probably be necessary to try to revise the normal programme of our congresses in order to give these meetings a more precise purpose. The scientific level of the papers read nowadays is evidently very different from that at the first congresses in Vienna and Budapest. Then "applied" ornithology and certain aspects of migration provided the main theme. Later

congresses at, for example, Oxford and Uppsala contributed much to the development of ornithology as biological knowledge. These are surely two very different lines. And it cannot be denied that a great number of the papers presented to congresses are of only local or passing interest.

It seems that ornithology has now reached a high scientific standard and is contributing much to the solution of zoological problems, and even of ones of general biology. Such aspects should particularly occupy the attention of international reunions. That is why I am taking the liberty of making some suggestions about the programme for the XIII Congress. We should perhaps envisage its organisation in the form of several symposia which bear upon general problems of the ornithology of our time. The subjects to be presented *and discussed* (it was, above all, the lack of discussion which, to my mind, lessened the scientific value of several past congresses) could perhaps be formulated in the following manner:

(a) Systematics. Theories of clinal variations and their possible application to formal systematics (the definition and naming of subspecies); allopatry and sympatry; broad groupings (orders) and their general interpretation from such angles as paleontology and evolution.

(b) Ecology (in the broad sense of the word). Problems of the seasonal cycle in the lives of birds, seasonal distribution, reproduction, moulting, changes in metabolism; correlation of internal and external factors; evolutionary aspects.

(c) Physiology. The rôle of the central nervous system on the one hand and of sight and hearing (connected with the problem of orientation) on the other; behaviour and its relation to reflexology.

(d) Faunistic studies. One would very much like to have some general information on this question, but it would be necessary to ask those concerned to analyse its scientific aspects.

(e) Bird life and the activities of man. This is a main problem of ornithogeography, as well as of biogeography in general; one could add to this symposium the study of quaternary faunas.

(f) As a new question, the rôle of birds in relation to medicine and veterinary surgery (compare, for example, the works of the World Health Organisation at Geneva).

The above are for the scientific programme. But what is one going to do with the lesser communications of the amateurs, which are sometimes interesting? Reject them *en bloc*? I do not think so, but what is the solution?

G. P. DEMENTIEV

Sirs,—The problem of an international ornithological congress is somewhat different from that of a congress in an "indoor" science

such as chemistry or psychology. Perhaps the nearest parallel would be an archaeological congress held in an area full of important remains. But at least ruins do not fly away if disturbed! It seems to me that one possibility would be to have an international ornithological society with some kind of qualification, whose members would have priority on all expeditions and would be the sole participants in some. Non-members could attend the congresses as associates but their papers would be liable to suppression, and would rarely be allotted much time. I may add that I attended the Basel congress as such an outsider. My paper on the statistical treatment of bird-ringing data interested about five people—one very much—but was quite unsuited for reading in full.

In my opinion the main value of such congresses is that they allow of personal discussions between people with common interests. These need not take place at the formal meetings, after the papers have been read. Many congresses would be definitely improved if a special office were opened entirely to facilitate such meetings of individuals. Sometimes, for example, I wished to ask a question of detail about a film which gave no opportunity for immediate questions.

I think it most important that congresses should have the minimum of non-scientific entertainments. A certain austerity would help to frighten away persons who are not really interested (including wives). On the other hand, there should be very ample opportunities for individual discussions.

J. B. S. HALDANE

Sirs,—Mr. Nicholson's review poses some important questions. A joint committee of the British Ornithologists' Union and the British Trust for Ornithology has already been discussing the difficulty of ensuring that ornithological effort in this country is adequately represented at international congresses, but an appeal to various foundations towards the very high travelling costs has so far met with no success. While it is probable that the senior professional ornithologists will usually get grants from their employers or from other scientific sources, this is not so likely for the younger professionals or for any of the competent amateurs. If it is agreed that one of the primary functions of an international ornithological congress is the exchange of ideas between workers in different countries and the consequent stimulation to further, and better, research, then it is important that the proceedings should not be confined to those who already have an established reputation. This inevitably means the creation of a fund for making grants towards travelling costs, and any suggestions which your readers may have for making this successful could be welcomed by the joint committee already mentioned.

Even if money were available to assist selected people to attend the

congresses, there remains the problem of ensuring that attendance will be worth their while as a serious contribution to the development of their own ornithological studies. I believe it is the intention of the organisers that one part of the indoor proceedings should consist of symposia on selected subjects with invited speakers, but that the second part should be set aside for unsolicited papers. Since contributions for the first part will be automatically screened the hazard of unimportant, or badly presented, papers should be avoided there. In the second part, however, I feel that the principle should be established now that anyone offering a paper should be obliged to send it in the first place to a national body in his own country, and that the organisers should have the explicit right to make a selection from papers which have already passed scrutiny in their country of origin.

The problem of excursions crowded by visitors who have no interest in the real proceedings should be dealt with by having two main categories of excursions, one on an invitation basis only, arranged by the organisers in consultation with representatives of national societies, and the other open to all visitors to the congress. This may seem too drastic, but opportunities for meetings of this kind are few and their success in the future will depend on the programme appearing worth while to the best students.

I would deplore, however, any restriction of the right to attend a congress, and since one of the functions of any gathering of this nature must be to foster international co-operation I feel strongly that some open sessions should still be held outside the set programme in which the emphasis would be primarily social.

R. C. HOMES

Sirs,—I would like to say how whole-heartedly I approve of everything that Mr. Nicholson said with regard to international ornithological congresses. One of the greatest difficulties is the size of these congresses. Up to 1939, when they were of manageable size, hardly any of the problems raised by Mr. Nicholson mattered greatly. Now they do, and part of the trouble, as he points out, is that many persons are attending primarily to get a "guided bird-watching trip abroad". Any form of discrimination among those applying to come seems highly undesirable in itself and might well operate unfairly, for instance cutting out comparatively unknown persons who might be likely to get great profit from attending and be active in ornithology in the future. With great reluctance, therefore, I have come to the conclusion that, for a European meeting, the only way to reduce the numbers effectively is to eliminate field trips. I suggest this with great reluctance because, in a conference of manageable size, field trips are one of the most enjoyable features. Not only does one see new and delightful birds, but one is thrown informally into the

company of others whom one did not know, in circumstances where it is much easier to make contact than in the formal sessions. However, if the price of having good excursions is for the congress to be swamped by persons who are not interested in its scientific side, so that those with a serious interest are unable to meet easily anyway, then I feel it should be the excursions that are abolished, and this would, I think, eliminate at one stroke those with no serious interest in the congress itself. For the same reason, I think it would also be desirable to eliminate those bird films, however well photographed, in which the primary interest is not biological. The B.O.U. Centenary Conference at Cambridge, which all agree was admirable, provided a highly satisfactory meeting without any field excursions, so that the latter need not be regarded as an essential part of an ornithological congress.

While I feel that there should be no selection of those attending a congress, I feel that there is a strong case for the selection of papers delivered. The programmes should, in my view, be less crowded and there should be more times free for informal discussion. There should also, in my view, be an even more drastic restriction of the papers published in full. Many of those in recent volumes of the *Proceedings* are either a repetition of what the author has published elsewhere in greater detail or, though at the time describing new work, have been superseded by a fuller publication between the time at which the paper was read at the congress and the publication of the *Proceedings*. Publication could be speeded up very considerably by the simple rule adopted by the organisers of the B.O.U. Centenary Conference at Cambridge—that no paper would be published in the *Proceedings* unless it was in the editor's hands within a month of the conclusion of the congress. Once authors realise that this threat will be carried out, it is remarkable how rapidly they submit their material!

Mr. Nicholson covered many other points in his extremely able and cogent review and I would only add that I agree with all of them.

DAVID LACK

Sirs,—I welcome warmly Mr. Nicholson's expression of unease in his review of the Helsinki Congress and its *Proceedings*. The subject has many difficulties and I want to comment on only a few of them.

(1) Consideration might be given to holding international ornithological congresses only as sections of zoological congresses. This course would cut out duplication of attendance; it would, apart from any other machinery, reduce the contributions of local or trivial interest; and it would not attract potential participants who were merely in search of a bird-watching holiday.

(2) Numbers attending ornithological congresses would be reduced

and the average quality of participation improved if the congresses were held in the local "off-season".

(3) The host country should not be subjected to the burden of publishing the *Proceedings* on the present scale. In abstracting for *The Ibis*, which is of necessity highly selective, it is particularly obvious how large a proportion of the papers in the *Proceedings* are too trivial for "notice", or re-hashes of work already published elsewhere, or preliminary statements which by the time the *Proceedings* appear have been (or almost immediately will be) superseded by fuller accounts elsewhere. Congress *Proceedings* might usefully be published by title and/or brief summary, leaving the full contributions to face the selection of the usual journals.

R. E. MOREAU

Sirs,—I agree with Mr. Nicholson that if future international ornithological congresses are to succeed, it is high time constructive proposals for reform should be put forward. The present problems can be summarized under six broad headings: finance, numbers and types of participants, standards of contributions, scope of the programme, excursions, and competition with other international meetings.

The financial problem has already reached such proportions that the selection of suitable host countries has become acutely difficult. The number of countries willing and able to support the cost and to provide the essential facilities, and within reasonable distance of the majority of potential participants, is very limited. I suggest consideration of the possibility of national levies towards a central fund under the administration of the Permanent Executive Committee, which would at least reduce the financial burden and increase the opportunities for enlarging the choice of suitable locations. The cost of producing the *Proceedings* might well be considered an appropriate subject for a continuing grant from e.g. UNESCO, rather than expecting the host country alone to subsidise the publication.

So long as the congresses continue in their present rather generalised form, combining science with entertainment, the sheer weight of numbers attending will inevitably increase and the proportion of what might be termed the tourist element will also continue to grow. There seem to be only two alternatives: to discontinue the congress excursions, which would mean a sad loss to many serious ornithologists whose only opportunity for seeing foreign birds may be at these meetings; or to hold the congresses in the winter, when the tourist element would be much less likely to be attracted. A possible palliative (though no solution) might be to divide the excursions more clearly into two classes: one for serious ornithologists willing to rough it, under the guidance of local field-men; the other for the sightseeing group, which would be guided by members of a social committee.

The latter group could and should be discouraged from joining the former. One might also consider limiting the registration of members to those who belong to their national ornithological societies as some indication of serious interest. It would not be unfair in the circumstances to ask registered members to pay higher rates for the attendance of their wives if, as is often the case, the latter were not ornithologists.

The standard of contributions at congresses obviously calls for a much stricter screening process. It is extremely difficult for the host country organisers to judge from a brief summary of a proposed paper whether the author is qualified in his subject. I suggest that a preliminary screening by a panel of local experts in each country should be carried out, thus leaving only the final selection to the congress programme organisers. It would then become the responsibility of the national panel to ensure both the standard of papers and films and the effective representation of its members at the congress. If the representation were considered insufficient the panel should seek ways and means of facilitating the attendance of those who, for financial or other reasons, might otherwise be unable to take part.

The programme for an international congress must cater for all interests, but there is no reason why the organisers should not be encouraged to select certain topics for symposium treatment, to which leading specialists from each country could then be invited to contribute. The secret of success is to select chairmen who will actively organise a stimulating level of free discussion of the papers. This was shown to work excellently at the B.O.U. Centenary Conference. But it did not happen by chance—it was planned. At many past congresses time-keeping has been bad and the opportunity for discussion therefore severely limited or completely absent. Time-keeping should be strict and we should try to overcome the lethargic atmosphere in which so many admirable papers are received. If by more severe scrutiny of contributions the total number of papers can be reduced, we might also minimise the occasions on which two leading experts speak on important topics at the same time in different lecture halls.

I applaud Mr. Nicholson's suggestion that some form of co-ordination should be devised to reduce the increasing competition between international meetings of various bodies. An acute problem of this kind exists even at a national level. Joint planning by the International Ornithological Committee, the Permanent Executive Committee of the International Congress and similar bodies should at least be attempted.

It is unlikely that so complex a list of questions as Mr. Nicholson poses can be satisfactorily answered by any one individual. I suggest that when the forum of *British Birds* has attracted its full quota of response, the letters should form the basis for a meeting of those best

qualified to represent the various interests of British ornithology. The pros and cons could then be objectively evaluated. All concerned—professionals and amateurs, not forgetting bird-watchers and excursionists—should express their views. Finally, let me suggest that any who are tempted to feel that the neophyte bird-watcher has no place at an international congress should remember the time when they too were beginners and eager to learn from those with greater knowledge. We shall not be building for the future if, in our anxiety to bring international ornithological congresses into more practical proportions, we exclude the keen young amateur who is not yet ready to make his contribution.

GUY MOUNTFORT

Sirs,—I have read with great interest the review by E.M.N. of the Helsinki *Proceedings* and his subsequent critique of the ornithological congresses. I heartily concur with him that it is an error not to group together papers which bear on the same general topic in any volume of *Proceedings* as well as adding to them the gist of discussions where pertinent. As I recall the discussions at Helsinki, however, they were usually far too brief or lacking altogether, or if long, far too long, so that the effect would be decidedly lopsided if in such a case they were not to be edited.

The points raised about the meetings themselves are entirely valid. It appears that such meetings are tending to become weighted down with hosts of birders eager to add to their life lists, and that in the midst of such a throng many serious ornithologists and other rare birds will slip away unobtrusively in the underbrush. And yet how to marry the two? Obviously, serious and keen ornithologists of every description, whether amateurs or professional, should be encouraged to come. In addition, ornithology with its museum, laboratory, university and foundation connotations cannot overlook some popular topics and popular support, especially in countries such as the U.S.A., Canada and the U.K. where private philanthropic support is sought. Ornithologists cannot be too exclusive for a variety of reasons. Younger, untried men and women must be encouraged.

The easiest solution would seem to be to cluster the subjects and interests in such a way that sessions could overlap. Bird trips or popular lectures for birders could go on at the same time perhaps as panel discussions on physiology, morphology or evolution which might be the primary concern of the specialist. Certain selected topics appealing to a wider audience could lead off open meetings. One difficulty with such an arrangement is that, as in the case of the International Zoological Congress in London, there are times when one wishes to be in two or more places at once. Very considerable discrimination is required to serve a menu for those with catholic

tastes. But it can be achieved with only minor hardship all round, especially if the eventual *Proceedings* are edited and arranged in the same manner.

Speaking for the International Council for Bird Preservation, I should say that we are most flexible in our arrangements. We are willing to have, and on most occasions do have, entirely separate meetings from the ornithological congresses. I should personally be inclined to favour increased separation as the total attendance at the congresses increases. Ornithologists who are interested will find their way to our meetings which, being small, are far more cohesive as to people in attendance and limited in subject matter.

The next congress in the United States is likely to accentuate the attendance problem brought out by E.M.N. Presumably relatively few foreign ornithologists will come, owing to distance and funds. Certain representative persons may well receive subventions to attend. A large block of ornithologists will stay away because of the dollar position. Thus there is likely to be a one-sided attendance of U.S. and Canadian ornithologists with perhaps a very few brightly plumaged representatives from Latin America or Japan. Lay people will probably not be encouraged to come, with the result that the meeting in its composition will bear a strong resemblance to one of the annual meetings of the American Ornithologists' Union. If this happens, then the U.S.A. meeting will be irrelevant as far as charting any broad or developing pattern for the future of congresses is concerned. Those who like a meeting of kindred souls will be pleased if they happen to be there. The others will merely be able to read about it a year or two later.

S. DILLON RIPLEY (*President, I.C.B.P.*)

Sirs,—I have read E. M. Nicholson's special review with great interest. It appears to me to have raised a number of important points and I should be glad of the opportunity to comment on a few of them and to suggest some possible ways in which congresses of the future might be improved.

First let me say that I feel that the more intangible benefits of these congresses are, in fact, the greatest ones and that they are the ones that follow from the opportunity for informal meeting and discussion between ornithologists of all types and from all countries. I think it would be quite disastrous if anything were done which harmed or destroyed this aspect of the meetings. Moreover, I should be very strongly against any action which hindered or restricted the attendance of amateurs, however young or inexperienced they may be. I am sure that many ardent amateurs, and in particular the younger members in both the amateur and professional classes, get enormous stimulation and profit from meeting and hearing the world leaders in their field of

particular interest and from mutual discussion with others of like mind at all levels. But anxious though I am to preserve these features of the congress, I do agree that some modifications in the type of publication, in the method of payment for publication and in the organisation of excursions are overdue. With these problems in mind, I would like to make the following suggestions:

(1) The size of the volume to be produced at each congress should be fixed beforehand.

(2) For each congress some particular (though very general) fields of ornithological science should be chosen for emphasis and to these fields the main energies of the congress, amounting to say 80% of the meeting time, should be devoted.

(3) The main speakers for dealing with these subjects should be invited.

(4) After the main speakers have been invited, the congress committee should accept suitable papers dealing with or relevant to these main fields from among those offered, to make up the required 80%.

(5) The remaining 20% of congress time should be filled with offered papers on fields other than those chosen for the main effort. If offered papers outside the special fields chosen are numerous, careful selection should be employed. A closing date for such offers would have to be fixed.

(6) Publication should be financed as at present for all the material in the 80% class and perhaps for some report of the main discussions. To secure adequate report of discussions involves tape-recording and heavy work in editing and translation, but if carried out carefully and critically it can be very well worth while.

(7) The rest of the space in the volume should be filled by selecting the best of the remaining papers.

(8) Authors of these supplementary papers should pay the costs of printing if they wish their papers to be published in full. Otherwise brief summaries only should be published.

(9) The number of places for each field excursion should be limited so that the success and pleasure of the trips are not endangered.

(10) The congress should be held at the season best calculated to secure the attendance of both amateurs and professionals and not necessarily at the time best suited for excursions.

It is my impression that while some of these suggestions involve much work for the organising committee and also the making of some invidious choices, none of them is impracticable and their adoption would help to bring the organisation of the congress into line with modern requirements and developments.

W. H. THORPE

Notice to Contributors

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: JACKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

MITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34. Various other conventions concerning references, including their use in the text, could be noted by consulting examples in this issue.

Tables should be numbered with arabic numerals, and the title typed above in the same style used in this issue. The title and any headings within the table should also be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a single page lengthways. All tables should be self-explanatory.

Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the final should be 8" wide): sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.

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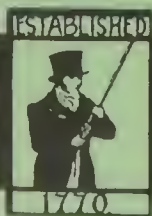
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British Birds

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The contamination of birds with pollen and other substances

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Warbler fluctuations in oak woodland in the Severn Valley

M. Philips Price

A survey of moulting Shelduck on Knechtsand

Friedrich Goethe

(with four plates)

Requests for information

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Three
Shillings



March
1961

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P. A. D. Hollom E. M. Nicholson
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Photographic Editor: Eric Hosking

Hon. Editors: W. B. Alexander N. F. Ticehurst

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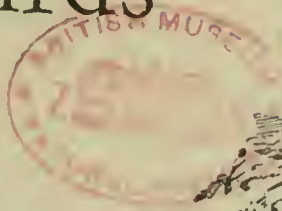
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British Birds

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MARCH 1961



The contamination of birds with pollen and other substances

By J. S. Ash, P. Hope Jones and R. Melville

AS A RESULT of an appeal in a paper by Ash (1959), further specimens of polleniferous contaminants, some containing other substances, were removed from the heads of migrant birds in 1960. The most notable contribution was made by P.H.J. in the Camargue, France. The general appearance of such contamination and its position on the bird has been described already (*op. cit.*); there is little new to add in this connection, except that the contaminant observed on the three ranches occurred not at the base of the upper mandible, as was the case with almost all the warbler records, but half-way along the mandibles (and in the case of the Siskin* on the lower mandible only). As the cementing material in these three deposits appeared to be pine resin, the position on the bill was probably fortuitous, depending on which part happened to make contact with an exuded tear of the sticky resin. A bird would have considerable difficulty in freeing itself from such a contaminant and, in its efforts to do so, it would scrape its bill against the branches. This would account for the presence of bark fragments, fungal spores and groups of algal cells of species commonly found on tree trunks. As in the earlier samples, *Citrus* pollen was the main constituent of the majority of the deposits, but smaller admixtures of pollen of *Acer* were found and small numbers of grains of *Pinus*, *Hypericum*, Liliaceae and Ericaceae, and Compositae of both subfamilies *Helianthemum* and *Ligulatae*. *Myrica* pollen was the main constituent of the deposits found on Chiffchaffs. Other incidental debris caught up in the deposits included sand, a mite and insect fragments. In the earlier examples it was considered that the *Citrus* pollen was rendered sticky and adherent by the presence of an oily material. Most of the scientific names are given in the list of records and the remainder in the text when the species concerned are first mentioned.

probably produced by the breakdown of the tapetal cells of the anthers. It now appears that pine resin may also act as a cementing material for the various substances found adhering to some of these birds. This material was readily soluble in xylene. A total of eight Blackcaps, one Goldfinch, one Siskin, one Chaffinch, one Orphean Warbler and one Robin carried nodules containing such a substance, and in four of these *Citrus* was absent or nearly so; these four were one Blackcap (no pollen) and the Goldfinch (one *Citrus* grain), the Siskin (no *Citrus* pollen) and the Chaffinch (almost pollen free). In the other examples *Citrus* pollen was also present and presumably acted as a contributory adherent. In the samples collected from Chiffchaffs, where *Myrica* pollen was the main constituent, it is probable that the sticky secretion of the catkin scales of this species acted as the binding substance. This proved to be insoluble in water and alcohol, and only softened in xylene.

All the records in the following list are from the Camargue unless stated to the contrary:

Blackcap (*Sylvia atricapilla*)

- 31.3.60 Moderate amount of *Citrus* pollen; a little debris
- 4.4.60 Fairly abundant *Citrus* pollen with much bark debris; fairly numerous fungal spores; a little sand; probably some pine resin
- 8.4.60 Almost pure *Citrus* pollen
- 8.4.60 Almost pure *Citrus* pollen with a little debris
- 9.4.60 Almost pure *Citrus* pollen; a little debris; a few fungal spores
- 9.4.60 Fairly abundant *Citrus* pollen; a little debris; a few algal colonies and fungal spores; a few grains of sand
- 13.4.60 A few pollen grains of *Pinus* and *Citrus*; the deposit was probably pine resin
- 13.4.60 Almost pure *Citrus* pollen
- 20.4.60 Almost pure *Citrus* pollen; a little debris; a few algal colonies
- 20.4.60 Abundant *Citrus* pollen; a moderate amount of debris; a few algal colonies
- 20.4.60 Much debris; some algal colonies; insect fragments; a few pollen grains, mostly *Citrus*; a few grains of sand; probably pine resin
- 21.4.60 Mostly sandy debris; a few pollen grains of *Pinus* and *Citrus*; one mite; probably pine resin
- 21.4.60 Almost pure *Citrus* pollen; a little debris
- 21.4.60 Almost pure *Citrus* pollen
- 21.4.60 Almost pure *Citrus* pollen
- 21.4.60 Almost pure *Citrus* pollen
- 21.4.60 Almost pure *Citrus* pollen; a little debris
- 22.4.60 Almost pure *Citrus* pollen; a little debris; a few fungal spores
- 22.4.60 Almost pure *Citrus* pollen; a little debris
- 22.4.60 Almost pure *Citrus* pollen

CONTAMINATION WITH POLLEN

- 2.4.60 Fairly numerous *Citrus* grains; a little debris; some insect fragments; probably some pine resin
- 2.4.60 Almost pure *Citrus* pollen
- 2.4.60 Almost pure *Citrus* pollen; a little debris
- 3.4.60 Free from pollen grains; a number of fungal spores; a little debris; probably pine resin
- 3.4.60 Almost pure *Citrus* pollen
- 8.4.60 Moderate amount of *Citrus* pollen; a few *Pinus* grains; probably some pine resin
- 8.4.60 Moderate number of *Citrus* grains; some debris; fungal spores and groups of alga (?*Pleurococcus*); probably pine resin mainly
- 9.4.60 Small amount of *Citrus* pollen; a few *Pinus* and other grains; fair amount of debris; a few algal colonies; probably mainly pine resin
- 5.60 Almost pure *Citrus* pollen
- 5.60 Cranborne, Dorset (per R. F. Hemsley). Mainly *Citrus* pollen with about 40% fertile grains; a few monocotyledonous grains (same as on Whitethroat of 1.5.60); one Compositae (Ligulatae); a few groups of cells of a green alga (*Pleurococcus*)

Whitethroat (*Sylvia communis*)

- 5.60 Portland Bill, Dorset (per J.S.A.). Mainly *Citrus* pollen with about 20% fertile grains; a small number of *Acer* grains, possibly *A. pseudoplatanus*; a few monocotyledon grains of Liliaceous type, not identified, but perhaps *Aloe*; a few individual grains of other plants; a few fungal spores

Chiffchaff (*Phylloscopus collybita*)

- 3.60 Abundant pollen of *Myrica* species, probably *M. gale* and *M. faya*; numerous fungal spores
- 4.60 *Myrica gale* and *faya* pollen with some fungal spores
- 60 *Myrica gale* and *faya* pollen with some fungal spores
- 60 *Myrica gale* and *faya* pollen with occasional fungal spores
- 4.60 Portland Bill, Dorset (per A. J. Bull). Almost entirely *Myrica* pollen, mostly *gale* with a little *faya*; a few grains of *Pinus*
- 60 Jersey, Channel Islands (per R. and M. L. Long). *Myrica faya* pollen cemented partly by exudate from a damaged eye
- 60 Great Saltee, Wexford (per Major R. F. Rutledge and B. H. Harley). Almost entirely *Myrica* pollen (both *M. gale* and *M. faya*); occasional grains of *Acer*; a few *Pinus* grains; fairly numerous fungal spores
- 60 Great Saltee, Wexford (per Major R. F. Rutledge and B. H. Harley). Exactly similar to the preceding record

The cementing material in all these cases was probably the sticky secretion of the catkin scales of *Myrica*.

Willow Warbler (*Phylloscopus trochilus*)

- 3.4.60 Abundant *Citrus* pollen; a little debris
- 15.4.60 Cranborne, Dorset (*per* R. F. Hemsley). Almost entirely *Citrus* pollen with about 50% fertile grains; a few fungal spores; one grain of *Juniperus*, probably *J. phoenicea*
- 21.4.60 Portland Bill, Dorset (*per* J.S.A.). Entirely *Citrus* pollen with about 25% fertile grains
- 1.5.60 Bradwell, Essex (*per* M. A. Ogilvie). Almost entirely *Citrus* pollen with about 20% fertile grains; a few fungal spores

Orphean Warbler (*Sylvia hortensis*)

- 21.4.60 Fairly abundant *Citrus* pollen; an occasional *Pinus* grain; some debris; probably pine resin

Chaffinch (*Fringilla coelebs*)

- 4.4.60 Almost free from pollen; much debris; a few fungal spores; probably pine resin

Goldfinch (*Carduelis carduelis*)

- 1.4.60 Almost free from pollen; one *Citrus* grain; some fungal spores and debris, cementing material probably pine resin

Siskin (*Carduelis spinus*)

- 22.3.60 Almost free from pollen; one Compositae (Tubiflorae); one Ericaceae; a little debris; cementing material probably pine resin

Robin (*Erithacus rubecula*)

- 8.4.60 Fairly numerous *Citrus* pollen; a few grains of *Pinus*; much debris; occasional algal colonies; some fungal spores; cementing material probably pine resin.

Various insects and small invertebrates are commonly caught up in the exuding pine oleo-resins, and it seems likely that the species contaminated with pine resin (Robin, Blackcap, Orphean Warbler, Goldfinch, Siskin, Chaffinch) had been feeding on this imprisoned food. As far as *Myrica* pollen is concerned, it is possible that the birds had been taking the pollen as food. It is well known that several species eat the buds of such trees as alder (*Alnus*), and one of us (R.M.) has observed Great and Blue Tits (*Parus major* and *caeruleus*) and Siskins eating the unopened anthers of aspen catkins (*Populus tremula*). *Myrica gale* is wind-pollinated and in Britain does not appear to be attractive to insect visitors. It is interesting to note that Chiffchaffs alone were contaminated with this pollen and it would be of interest to have observations on bird visitors to this plant at flowering time.

There is very little evidence at the present time to indicate by which routes summer immigrants reach the Camargue. They may arrive from North Africa either by a direct crossing of the Mediterranean, or through the Iberian Peninsula or the Balearics, and in some cases possibly via Corsica and Sardinia or Italy. As all the collected samples were taken from newly arrived immigrants on the coasts of both France and Britain, it can be assumed (except in the cases of the two Cranborne birds and the six Tour du Valat Blackcaps) that contamination occurred before arrival. The British-taken examples containing *Citrus* pollen of a high degree of sterility indicated that they had originated from clones of hybrid origin, probably from the cultivated groves of south and east Spain.

The presence of *Citrus* pollen, however, does not throw much light on the problem of the migratory paths of the birds. Oranges and lemons are cultivated in all the countries that lie across possible routes, from Morocco to Tunisia in North Africa, and in Spain, Portugal, Italy and southern France. For similar reasons the presence of pine pollen does not help. More definite conclusions can be drawn from the *Myrica* contaminant on the Chiffchaffs, however. The deposits contained pollens of two *Myrica* species in varying proportions. One, *M. faya*, is native to the Azores, Canaries and Madeira, doubtfully native to the mountains near Algeciras and subsynchronous in a few other places in south-western Spain and southern Portugal. The other species, *M. gale*, is native to the north-western corner of Spain and occurs here and there in Portugal and south-western Spain. It also ranges through western France, Britain and Ireland, and north-western Europe in general. The presence of *M. faya* suggests that the Chiffchaffs concerned may have over-wintered in the Azores or Canaries. Those that were trapped in the Camargue probably took a route through south-western Spain, where they had a chance of picking up both *Myrica* species, and thence flew up the eastern seaboard of the Iberian Peninsula. Some of the Chiffchaffs trapped in Britain and Ireland had a larger proportion of *M. gale* pollen than of *M. faya* pollen. They probably took a western route up through Portugal and north-western Spain, which brought them into contact with more *M. gale*. A single specimen from Jersey consisted of pollens which all fell within the size range of *M. faya*. The bird from which this was taken had received an injury which had resulted in the loss of an eye. The pollen deposit had matted the feathers above the bill and extended back to the eye on one side and past the empty eye socket on the other. An examination of part of the deposit, kindly undertaken by Mr. J. D. Macdonald of the British Museum (Natural History), demonstrated that in this case the material cementing the grains consisted partly of exudate from the damaged eye socket.

BRITISH BIRDS

TABLE 1—THE NUMBER OF POLLEN-CONTAMINATED BLACKCAPS (*Sylvia atricapilla*) TRAPPED IN THE CAMARGUE IN SPRING 1960

	Number trapped	Number contaminated	Percentage contaminated
28th March-2nd April	28	1	3.6
4th April-10th April	80	5	6.3
19th April-24th April	133	16	12.0
25th April-10th May	47	1	2.1

Most of the French material was collected during the course of a migration-study camp in the spring of 1960 at Beauduc on the Camargue shore. Between 20th March and 10th May over 2,500 birds were handled, of which 33 (1.3%) were found to be carrying material on their bills. The two species giving most records were the Blackcap, with 23 cases in 293 trapped (7.8%)* and the Chiffchaff, with 4 in 98 trapped (4.1%). One record was obtained for each of the following, the figure in brackets being the total number trapped: Robin (433), Orphean Warbler (13), Willow Warbler (224), Goldfinch (4), Siskin (10) and Chaffinch (37). It is interesting to note in Table 1 that in this preponderance of Blackcap records the proportion of birds contaminated with pollen was not constant, but varied during the four fairly distinct phases of the species' immigration. Probably this rise and fall in the number of contaminated birds is correlated with the flowering of the *Citrus* orchards in southern Spain and possibly in Morocco, but no precise information on the timing of these crops is available at present.

The combined contamination rate during these four phases of the Blackcap migration was 7.2% in males (10 in 138) and 8.7% in females (13 in 150). The vast majority of Passerines trapped at Beauduc showed no trace of contamination. To list all these would be tedious and of doubtful value, so the following summary has been confined to the smaller Passerine species of which over 10 individuals were trapped, and of which none showed any sign of contamination (figures in brackets being the total number trapped): Pied Flycatcher (*Muscicapa hypoleuca*) (147); Wood Warbler (*Phylloscopus sibilatrix*) (16); Garden Warbler (*Sylvia borin*) (26); Whitethroat (98); Nightingale (*Luscinia megarhynchos*) (92); Redstart (*Phoenicurus phoenicurus*) (450); Black Redstart (*Ph. ochruros*) (65); Wheatear (*Oenanthe oenanthe*) (12); Dunnock (*Prunella modularis*) (23); Tree Pipit (*Anthus trivialis*) (13); Ortolan Bunting (*Emberiza hortulana*) (16); Linnet (*Carduelis cannabina*) (15); Greenfinch (*Chloris chloris*) (13).

* 29 Blackcap records from the Camargue are listed in this paper, but six of these are from La Station Biologique de la Tour du Valat and are therefore not included in these figures.

The relatively high proportion of contamination amongst Blackcaps, always with *Citrus* pollen, suggested that this species might be a more constant visitor to flowers than the other warblers. In fact, some earlier observations by Lowe, quoted by Swynnerton (1916), do bear evidence that the Blackcap is a regular nectar feeder. In Teneriffe and the Grand Canary it was seen to tear the calyx of *Hibiscus rosa-sinensis* and puncture the corollas of *Aloe vera*, subsequently visiting these plants from time to time to take the nectar. The Garden Warbler and Willow Warbler were also observed to behave in a similar manner, but a Blue Tit (*Parus caeruleus teneriffae*) punctured *Abutilon* blooms and later returned to them to feed on ants that had gorged themselves on the copious nectar. The flowers mentioned are too large for these small birds to be able to reach the nectar by the normal floral aperture, but Blackcaps could reach the nectar directly in *Citrus* blossoms. In doing so they would be unable to avoid touching the stamens and would necessarily pick up pollen on the forehead. Whether they visit *Citrus* flowers for nectar, or for insects as well, can be decided only by direct observation. It is worth noting that Swynnerton records Blackcaps being brought home by Captain Boyd Alexander from the Cape Verde Islands with their foreheads yellow with pollen.

Although nectar-feeding, which usually results in the pollination of the flowers visited, is well known, groups such as the Coliidae, Nectarinidae, Zosteropidae, Meliphagidae and Drepanidae, which specialise in this habit, are not represented in Europe. It is therefore most interesting to find evidence that members of the Sylviidae also visit flowers. The presence of *Citrus* pollen on the foreheads of numerous Blackcaps leaves no doubt that they have visited the flowers and, moreover, that they approached the blossom in such a way that they must have been effective pollinators. Two factors may militate against the continuation of this habit in the British Isles. Firstly, the lower temperatures of our spring and summer are not conducive to a free flow of nectar. Secondly, the birds are here primarily for breeding, for which purpose the high protein content of their usual insect food is necessary. However, ornithologists and botanists should be on the alert to observe and report the actions of these birds in the vicinity of flowers.

ACKNOWLEDGEMENTS

We should like to take this opportunity of thanking the following for their interest in submitting samples for examination: R. F. Hemsley (Cranborne), A. J. Bull (Portland Bird Observatory), M. A. Ogilvie (Bradwell Bird Observatory), Mr. and Mrs. R. Long (Jersey Bird

Observatory) and Major R. F. Ruttledge and B. H. Harley (Saltee Bird Observatory).

SUMMARY

(1) A further collection of pollen contaminants from migrant birds has been analysed. The samples were collected in the Camargue (France), Jersey, Ireland and three localities in two English counties.

(2) *Citrus* pollen was the main constituent in most of the samples. *Myrica* pollen was predominant on Chiffchaffs (*Phylloscopus collybita*). Other pollens included those of *Acer*, *Pinus*, *Juniperus*, Liliaceae and Ericaceae; and, from the Compositae, those of both Tubiflorae and Ligulatae. Other incidental debris was also found. Pine resin was present as an adherent.

(3) In some cases, pollen may be taken as food; in others, birds may be contaminated by pollen when seeking either nectar or insects attracted to blossom.

(4) The presence of pollen of two species of *Myrica*, with slightly overlapping distributions, throws light on the routes followed by Chiffchaffs to southern France and to Britain and Ireland from their winter quarters.

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APPEAL FOR SPECIMENS

Further records will do much to add to our knowledge of this subject, and probably other pollens will turn up to throw additional light on migration routes. Ultimately it is the occasional contaminant that may prove most useful in this respect. Ringers anywhere in Europe are asked to look for pollen nodules on birds and to send these to any of the authors, but preferably to Dr. R. Melville, Royal Botanic Gardens, Kew, Richmond, Surrey, without a preservative and with the following information: species of bird, location of pollen on bird, date, locality, name and address of finder, and any relevant information on the migratory state of the bird.

Warbler fluctuations in oak woodland in the Severn Valley By M. Philips Price

TWO PREVIOUS PAPERS of mine in *British Birds* (1935, 1950) gave population statistics for the Nightingale (*Luscinia megarhynchos*) and four species of warbler—Willow Warbler (*Phylloscopus trochilus*), Chiffchaff (*Ph. collybita*), Garden Warbler (*Sylvia borin*) and Blackcap (*S. atricapilla*)—in an area in the Severn Valley near Gloucester. I



G. 1. Sketch map of area of warbler population counts near Gloucester, 1927-60. This 200-acre section of woodland consists predominantly of oak with some ash and, in parts, various conifers and the woods are interspersed with a few grass orchards and arable fields (see below)

I have been able to continue my observations up to and including 1960 and so now bring the figures up to date. In the earlier papers I gave population figures for a tract of country about 2,000 acres in extent and about five to seven miles west of Gloucester. Within this area I also gave separate figures for a 200-acre section of oak woodland and grass orchards. The data which follow here cover this woodland and orchard area alone, and not the larger one. They concern the whole period of investigation, the 33 or 34 years from 1927 or 1928 to 1960.

Fig. 1 is a plan of the area. The woodlands are interspersed with a few arable fields and grass orchards and consist predominantly of oak with some ash. Over the last forty years parts of the oak and ash have been felled and replanted with a mixture of these two trees and the conifers (including *Thuja*). The younger plantations are thus of various ages from five to forty years. In the youngest ones there is

BRITISH BIRDS

TABLE 1.—FLUCTUATIONS IN THE POPULATIONS OF CHIFFCHAFFS (*Phylloscopus collybita*), WILLOW WARBLERS (*Phylloscopus trochilus*) AND NIGHTINGALES (*Luscinia megarhynchos*) IN 200 ACRES OF PREDOMINANTLY OAK WOODS NEAR GLOUCESTER, 1927-60

In each case column A gives the total population, column B the number of unmated males and column C the number of nests found or broods located.

	Chiffchaff			Willow Warbler			Nightingale			
	A	B	C	A	B	C	A	B	C	
1927	No counts			No counts			5	3	1	1927
1928	5	1	2	7	1	3	7	3	2	1928
1929	4	2	1	11	3	4	6	2	2	1929
1930	5	5	0	11	3	4	6	2	2	1930
1931	8	2	3	16	4	6	4	2	1	1931
1932	8	2	3	16	2	7	5	1	2	1932
1933	10	6	2	6	0	3	4	0	2	1933
1934	12	4	4	9	3	3	7	1	3	1934
1935	13	3	5	14	2	6	10	2	4	1935
1936	11	3	4	14	2	6	17	1	8	1936
1937	10	4	3	9	3	3	13	5	4	1937
1938	11	3	4	13	5	4	13	1	6	1938
1939	12	2	5	18	2	8	15	3	6	1939
1940	8	2	3	10	2	4	15	1	7	1940
1941	10	2	4	12	6	3	15	1	7	1941
1942	12	0	6	10	0	5	14	2	6	1942
1943	9	1	4	9	1	4	16	1	7	1943
1944	17	1	8	4	2	1	16	2	7	1944
1945	6	4	1	6	4	1	14	2	6	1945
1946	8	2	3	8	2	3	15	3	6	1946
1947	6	2	2	6	2	2	14	4	5	1947
1948	13	1	6	3	3	0	16	2	7	1948
1949	12	2	5	5	3	1	24	6	9	1949
1950	16	0	8	7	5	1	23	5	9	1950
1951	14	0	7	6	2	2	16	2	7	1951
1952	15	3	6	7	1	3	19	3	8	1952
1953	13	1	6	4	4	0	17	3	7	1953
1954	12	0	6	3	3	0	16	2	7	1954
1955	9	1	4	3	3	0	18	2	8	1955
1956	12	0	6	5	3	1	18	4	7	1956
1957	12	0	6	2	0	1	13	3	5	1957
1958	13	1	6	2	1	0	10	2	4	1958
1959	6	0	3	4	0	2	7	1	3	1959
1960	10	0	5	2	0	1	7	3	2	1960

thick undergrowth, ideally suitable for certain warblers. In the older parts of the woods there is shade or half-shade and less nesting ground for warblers, but brambles now grow extensively in the half-shade and provide some suitable cover for Chiffchaffs, Garden Warblers, Blackcaps and Nightingales, but not for Willow Warblers. Here

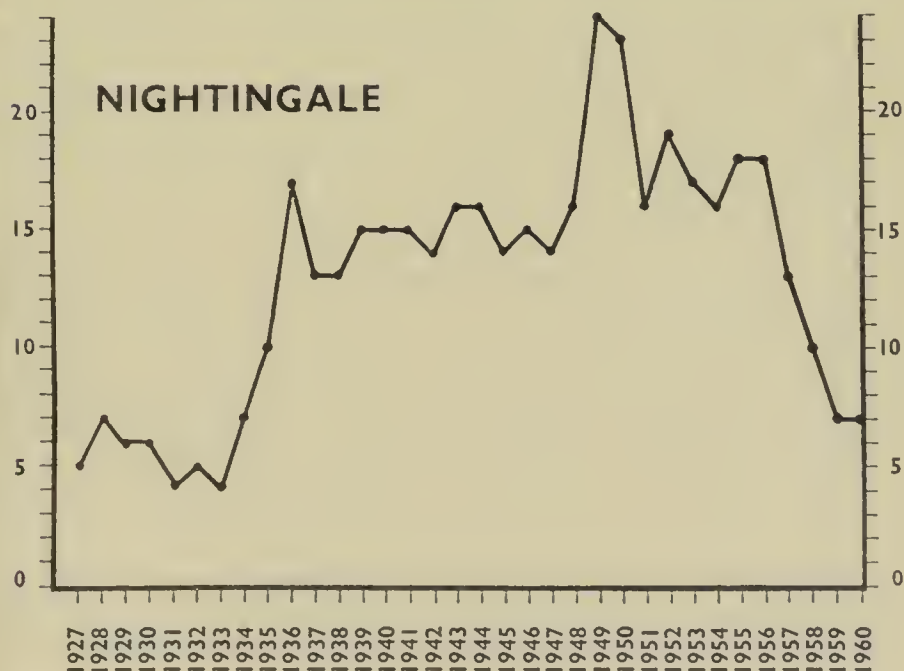
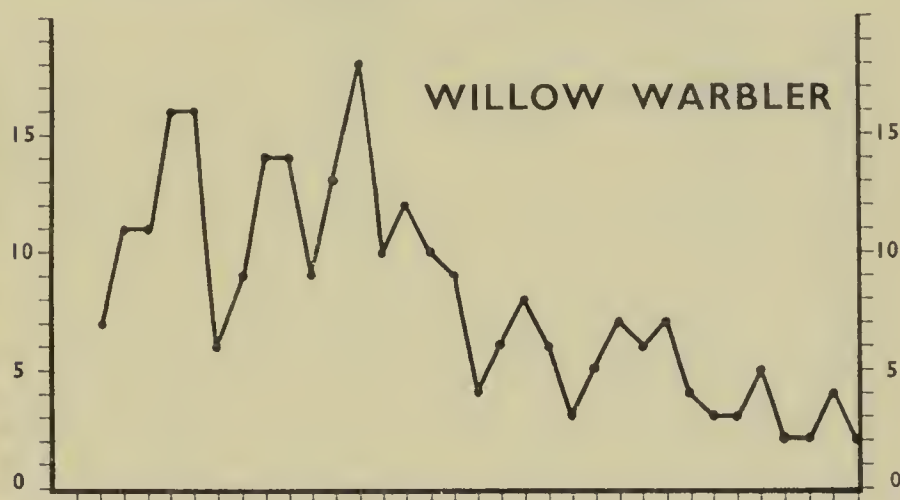
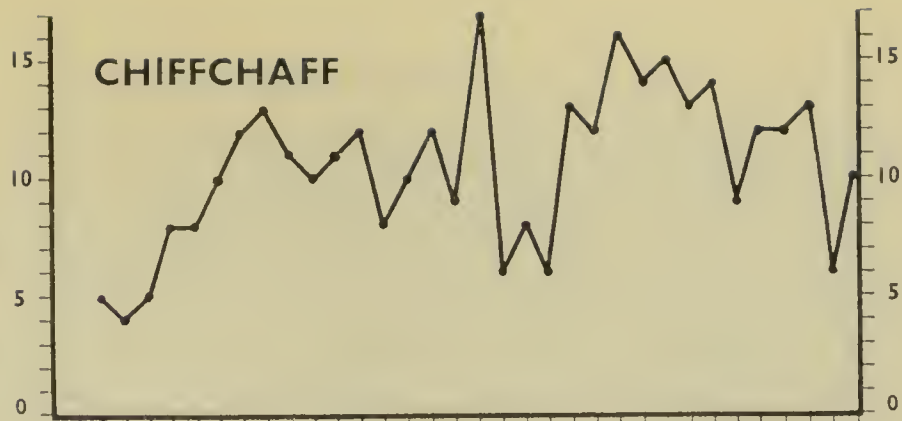


FIG. 2. Population fluctuations of three species in 200 acres of predominantly oak woods near Gloucester, 1927-60. Note the comparative steadiness of the Chiffchaff (*Phylloscopus collybita*), the general decline of the Willow Warbler (*Phylloscopus collybita*) and the recent decline of the Nightingale (*Luscinia megarhynchos*) after a peak in 1949-50 (see pages 104-105)

and there are patches of derelict ground covered with thorn and privet, but this is being cleared and planted.

Table 1 gives the total populations of Chiffchaffs, Willow Warblers and Nightingales for each of 33 years (34 in the case of the Nightingale), together with the numbers of unmated males and the numbers of nests found (the total population figures include unmated males as well as breeding birds). The populations of unmated males seem to fluctuate considerably and amount to quite a big number in some years. There is no apparent reason for this, though it is just possible that there may be a link with weather conditions.

The total population figures are also shown in graph form in Fig. 2. The Chiffchaff population and nest numbers rose to a peak in 1944, after which three very lean years were followed by a build-up to another peak in 1950. This peak was not maintained and there was a slight decline over the next few years, but today the position seems fairly stable with about five or six broods reared annually. The Willow Warbler population, on the other hand, reached its peak in 1939 and has declined ever since. In four of the last eight years no broods were reared at all and in the whole of that time the number of pairs present exceeded four only once. The Willow Warbler's position is becoming similar to that of the Wood Warbler (*Ph. sibilatrix*) which disappeared completely from these woods after 1934, having reared one or two broods each year until 1930 (Price 1950, p. 349). A list of the numbers of Rabbits (*Oryctolagus cuniculus*) killed on the estate concerned during 1927-50 (Price 1950, p. 351) showed that these declined from 1946 onwards so that the figures were lower than in almost any year except the war-time ones when there were difficulties in getting trapping labour. The coming of myxomatosis in 1954 then virtually wiped out the Rabbit population. The decline of the Rabbits coincided with, and was almost certainly the cause of, the general increase of bramble which these rodents had kept down. The Wood Warbler disappeared when the bramble began to cover the bare floor of the oak forest, the best nesting place for this species, and after the war the bramble became so dense that not only could the Wood Warbler find no nesting ground but the same began to apply to the Willow Warbler. This did not seem to affect the Chiffchaff so much, however, and this is what one would expect, for the bramble provides suitable nesting sites for it a few inches above the ground. Nevertheless, as we have seen in Table 1 and Fig. 2, the numbers of Chiffchaffs are not as high as they have been and it looks, therefore, as if there may be other factors at work in a general decline in the warbler population in this area of Gloucestershire.

Of special interest in this connection is the very recent decline in the Nightingale population. This species is not at all adversely affected

WARBLER FLUCTUATIONS IN THE SEVERN VALLEY

TABLE 2—NUMBERS OF NESTS FOUND AND BROODS REARED AMONG BLACKCAPS (*Sylvia atricapilla*) AND GARDEN WARBLERS (*Sylvia borin*) (combined) IN 200 ACRES OF PREDOMINANTLY OAK WOODS NEAR GLOUCESTER, 1928-60

Nests Broods			Nests Broods			Nests Broods		
1928	1	1	1939	0	0	1950	3	2
1929	2	2	1940	0	0	1951	2	2
1930	0	0	1941	3	2	1952	1	1
1931	1	1	1942	1	0	1953	4	3
1932	0	0	1943	4	3	1954	1	1
1933	1	1	1944	5	4	1955	5	1
1934	3	1	1945	0	0	1956	1	1
1935	0	0	1946	0	0	1957	2	0
1936	0	0	1947	3	2	1958	3	2
1937	2	1	1948	2	1	1959	1	1
1938	0	0	1949	1	0	1960	2	1

by a general growth of brambles and ground vegetation. On the contrary, such growth provides an increased number of nesting sites and conditions now are much more favourable in this respect than they were in the 1920s and 1930s. For a time, indeed, the Nightingale population actually showed signs of increase with the growth of bramble and a peak was reached in 1949-50. Then, however, a steady and persistent decline began in 1957 and, from information obtained from other parts, this seems to be general in the Severn Valley. The Nightingale population, which at one time was advancing into parts of Wales and Monmouthshire where it had not been before, is now receding. It is not clear what the cause can be. There are those who think that the increase in spraying of agricultural crops has had some effect on insect-eating birds, but that would hardly apply in these woods. It is also thought that the anti-locust spraying in Africa has affected their winter foods; Mr. J. G. Williams of the Coryndon Museum, Nairobi, says that the numbers of insectivorous birds passing along the Kenya coast have been growing less in recent years. Other local factors might include climatic changes and the age of the woodland, though any effect that these particular ones may have on breeding conditions is not clear at present.

Table 2 has been prepared in an attempt to show whether there is any similar trend in the populations of Blackcaps and Garden Warblers. Unfortunately these two species are less easy to study and I have found it impossible to determine with any accuracy the numbers of unmated males. The figures, therefore, are confined to those of nests found and broods reared. No firm conclusions can be drawn from them, but it should be pointed out that neither the Blackcap nor the Garden

Warbler is affected by the growth of bramble and ground vegetation. Indeed, this should increase the number of nest sites available for them.

Whatever the causes of the general tendency towards decline, they must certainly be complex. It would be interesting to find out more about the changes, if any, in the warbler populations in other parts of Britain.

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A survey of moulting Shelduck on Knechtsand*

By *Friedrich Goethe*

Vogelwarte Helgoland, Headquarters Wilhelmshaven

(Plates 18-21)

INTRODUCTION

GROSSER KNECHTSAND is an extensive maze of channels and sand-banks which lies 8.1 nautical miles from the German mainland between Bremerhaven and Cuxhaven. It extends from 8°18'E to 8°29'15"E and from 53°52'18"N to 53°46'15"N. Robins Balje is a natural boundary on the south-west side, while the north-eastern and southern boundaries are formed by the Neu-Cappeler Tief and the Dorumer Tief (Fig. 1). The highest rise above normal mean tide (1-2.2 metres or roughly 3-7 feet) is on the north-western side. The sand-banks are dry at low water, but at normal high water and also in strong wind and swell only a small number of acres remain clear. In 1930 it must have been about two hectares (Schulz 1947) or roughly five acres, though now it is much larger. Various channels serve as

*We wish to apologise for the delay in the publication of this paper owing to difficulties in preparing the final English text, which also had to be considerably shortened. The Knechtsand area is of considerable concern to ornithologists in this country, not only because the R.A.F. were using it for bombing practice, but more particularly because these sandbanks make up what is probably the Shelduck's most important moulting ground in the whole of Europe. The moult migration of the Shelduck is a peculiar phenomenon which has really come to light only in the last twenty years, following the work of J. Hoogerheide and W. K. Kraak (1942, *Ardea*, 31: 1-19) and R. A. H. Coombes (1949, *Ibis*, 92: 405-418). It is now known, however, that this moulting area on the North Sea coast of Germany gathers birds from many parts of the Continent and that the majority of British

MOULTING SHELDUCK ON KNECHTSAND

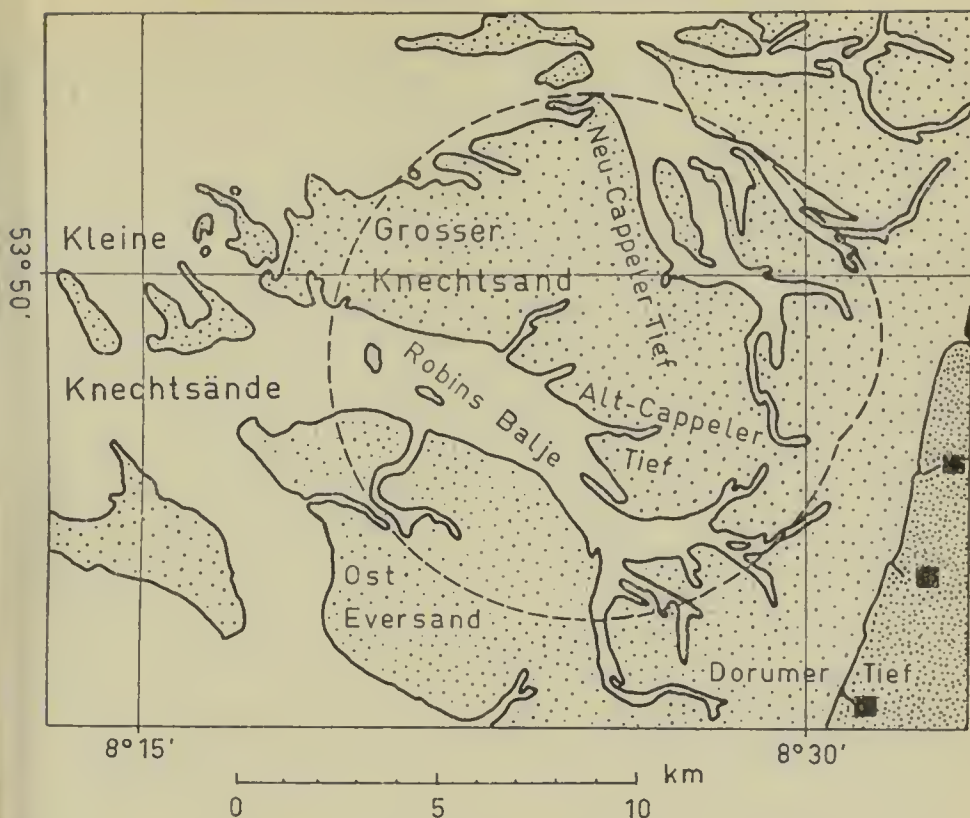


FIG. 1. Map of the moult area of Shelduck (*Tadorna tadorna*) on Knechtsand, (Germany, with the R.A.F. bombing range indicated by the extended circle (see text on page 108)

waterways and connections for small coastal craft, not only between the sluice gates and the open sea but also between the Weser and the Elbe. These channels in the mud-flats hold less water than normal during prolonged east wind and more during prolonged west wind (Deutsches Hydrographisches Institut 1947). As happens everywhere in the shallows of the southern North Sea, the contours of the sand and mud-flats are subject to considerable changes. The sea bottom on the seaward edge to the north-west consists of firm sand, but the area towards the south is more muddy, particularly along such parts as,

Shelduck also migrate there in July. Shelduck moulting grounds are few in number and probably all long established. The only one known in Britain is at Bridgwater Bay in Somerset. Even this is far smaller than the Knechtsand one and only about 2,500 to 3,300 Shelduck have been estimated there each year since the moulting ground was discovered as late as 1951 (see D. H. Perrett, 1951 and 1953, *First and Second Reports of the Mid-Somerset Naturalist Society*; also *Reports on Somerset Birds, 1951-1959*; and, particularly, S. K. Eltringham and H. Boyd, "The Shelduck population in the Bridgwater Bay moulting area", *Eleventh Annual Report of the Wildfowl Trust, 1958-1959*, pp. 107-117). We are publishing a second paper by Dr. Goethe next month and that will be concerned with the moult migration along the coast of Germany.—Eds.

for example, Schietloch, Alt-Cappeler Tief and Spiekaer Barre. Many molluscs occur here, including beds of Mussels (*Mytilus edulis*). As far as existing information goes, the east side of the Neu-Cappeler Tief is equally rich in marine life.

According to Schulz (1947), the part of Grosser Knechtsand that is normally always uncovered was a sanctuary of the Bund für Vogelschutz e.V. (Headquarters Stuttgart) from 1928 to 1933 on account of the Little Terns (*Sterna albifrons*) and Common Terns (*S. hirundo*) which nested there. This sanctuary was not continued, however, as the uncertainty of the tides made the protection of the sand-bank hardly worth-while. The real ornithological significance of the area lies, in fact, in quite a different direction, for the Knechtsand is probably the most important moulting ground for Shelduck (*Tadorna tadorna*) in Europe, gathering birds from Britain, Ireland and France, as well as from Belgium, Holland, Denmark and the Baltic. Although an editorial note in this journal (*Brit. Birds*, 48: 192) showed that as recently as 1952 many ornithologists were not aware of this, the first mention of moulting Shelduck there was made by Gechter (1927, 1939). Then in 1952 the limelight fell on Knechtsand when, in connection with the release of Heligoland from military occupation, agreement was reached between the German Federal and British governments to establish a practice bombing range there. The practice area mainly comprised a circle with a radius of 3.5 sea miles and a centre bearing of $53^{\circ}48'54''\text{N}$ and $8^{\circ}25'10''\text{E}$, but also included the extension resulting from a smaller and largely overlapping circle with a radius of 2 sea miles round a bearing of $53^{\circ}49'9''\text{N}$ and $8^{\circ}28'22''\text{E}$ (Fig. 1), making a total area of about 135.4 sq. km. (roughly 52.3 sq. miles).*

During the moulting season of 1953 no bombs were dropped on the Knechtsand range. In the summer and autumn of 1954, however, evidently on account of the very rainy and cold weather, there was a general delay in the breeding cycle and this affected the moult of the Shelduck so that it continued even into October. Between 21st August and 17th September of that year 12,384 Shelduck were killed either directly or indirectly by bombing. This figure was the minimum estimated from censuses made by the Vogelwarte Helgoland in its capacity as centre for sea-bird protection. As observers found no injury on the majority of the dead birds, except for blood on their beaks, it must be assumed that there had been considerable air pressure which had resulted in rupture of the lungs. Shelducks dive when frightened and it is possible that the high pressure of detonations under

*This was the area that was actually used. In fact, the original note of 9th September 1952 from the German Federal Chancellor to the British High Commissioner provided for a circle of radius 6.4 km. (approximately 3.98 miles or 3.45 sea miles) and centre bearing $53^{\circ}49'8''\text{N}$, $8^{\circ}26'2''\text{E}$.

water caused great damage to them. At the same time, bombs which exploded in the air before reaching the ground or the surface of the water may have affected Shelducks over large areas.

The Zentralstelle für den Seevogelschutz provided detailed reports on this to the British Section of the International Committee for Bird Preservation. Further reports were sent by the German Section and the Bundesanstalt für Naturschutz und Landschaftspflege and by the Deutsche Naturschutzring to the German Federal Government. An early result of the efforts made by the British Section was a Question in the House of Lords on 16th February 1955. In answer to this it was announced that only practice bombs, containing a small charge to set off a smoke marker, would be used during the next moulting period and that an international scientific commission, working in collaboration with the Royal Air Force, would investigate the situation on Knechtsand. After careful preparation by the International Committee for Bird Preservation in London, a commission of six was appointed and met as guests of the Royal Air Force at Oldenburg from 8th to 14th August. Its members were:

Dr. Boje Benzon (Denmark) (*Chairman*), Chairman of the European Section and of the Danish Section of the International Committee for Bird Preservation (I.C.B.P.)

Dr. John Berry (Great Britain), Director for Scotland of the Nature Conservancy, Representative of the British Section of the I.C.B.P. and President of the Commission on Ecology of the International Union for the Conservation of Nature (I.U.C.N.)

Dr. Gerrit A. Brouwer (Netherlands), Vice-Chairman of the European Section and Chairman of the Netherlands Section of the I.C.B.P., President of the Netherlands Society for the Protection of Birds

Wing-Commander the Rev. J. H. K. Dagger, M.A., liaison officer for the Royal Air Force

Regierungsrat Dr. Herbert Ecke (Germany), Deputy Director and Section Head of the Bundesanstalt für Naturschutz und Landschaftspflege in Bonn, Manager of the German Section of the I.C.B.P.

Dr. Friedrich Goethe (Germany), Scientific Assistant of the Vogelwarte Helgoland, Institut für Vogelforschung und Zentralstelle für den Seevogelschutz in Wilhelmshaven

In addition, Professor Dr. Rudolf Drost (Germany), Director of the Vogelwarte Helgoland and Vice-Chairman of the German Section of the I.C.B.P., took part in preparatory negotiations and in a supplementary aerial survey, carried out extensive investigations in the air, on water and on land, and after exhaustive discussions agreed on the necessary recommendations to be made to the British Air Ministry.

The work of the Commission in Oldenburg was preceded and followed by additional investigations made by individual members of the Commission. The practical conclusions were incorporated in an interim report which was submitted to the British Air Ministry in October 1955 with an important recommendation for the protection

of moulting Shelduck. Thereupon, in a letter dated 29th December 1955 to the British Section of the I.C.B.P., the Ministry undertook to refrain from the use of live bombs on Knechtsand during the months of July, August and September (see Annual Report 1955 of the British Section of the I.C.B.P.; also Ecke 1956 and Goethe 1956). The present scientific report has been much delayed because the quantitative evaluation of the aerial photographs and the translation and abridgement of the text required a great deal of time.

OBSERVATIONS AND ESTIMATES FROM AIRCRAFT

Flying over the centre of the moulting area of the Shelduck was one of the most unforgettable sights ever experienced by any of those involved. In the air the field observer has first of all to accustom himself to the bird's eye view from which he is now seeing things. The disturbed sense of balance at first makes an orientation in space difficult, all the more so in this case as there were scarcely any distinguishing features on the mud flats and open water. In addition, there were the many sudden movements of the aircraft and the observers had to take in objects with lightning speed when flying low over the flats. In reconnoitring, a speed of 160-190 kilometres per hour (roughly 100-120 m.p.h.) was maintained. The best height for distinguishing details was between 60 and 100 metres (roughly 200-325 feet). Estimates by counts could easily be made at 200 metres (650 feet) and were still quite possible at 300 metres (nearly 1,000 feet).

In counting Shelducks we were very fortunate because these striking and brightly coloured birds, mostly white and black (or blackish green), are conspicuous in all lights and distinguishable from great heights. The same is the case with Oystercatchers (*Haematopus ostralegus*), especially in flight. It is even easy, because of the absence of the normal black primaries, to distinguish moulting Shelduck from others up to heights of 300 feet. There are great difficulties, on the other hand, in observing such protectively coloured waders as Curlew (*Numenius arquata*), Knot (*Calidris canutus*) and Bar-tailed Godwit (*Limosa lapponica*) from the air, not only when they are standing on the sand but also in flight. This has been proved at the observatories of Mellum and Scharhörn by making simultaneous counts from the ground and from the air. However, in general, most large species—for example, the various larger gulls—are easily identified up to a height of 1,000 feet, provided it is clear. It is easiest to make observations from a slow, one-engined aircraft.

A rough estimate was made on 9th August 1955 of the enormous belt of moulting Shelduck which at high water extended right along the exposed sand of Grosser Knechtsand and, discounting small groups and their corresponding multiplication, this came to a minimum

of 75,000 and a maximum of 100,000. In their subsequent discussions the members of the Commission were in agreement about these limits. With the help of some oblique photographs it was possible to make a more exact calculation. The birds were counted in various sections, the lengths of which could be estimated approximately, and an average was thus worked out. By knowing his time and speed, the pilot could calculate the total length of the belt fairly exactly—on this occasion it was 4,000 metres (roughly 4,375 yards or about $2\frac{1}{2}$ miles)—and so a total of 70,000 Shelduck was arrived at. This figure corresponded extraordinarily closely with the roughly estimated number. How well it agreed with the results of the evaluation of the aerial photographs will be seen in the next two pages.

The use of field-glasses was impracticable owing to the vibration of the engines.

EVALUATION OF AERIAL PHOTOGRAPHS

In addition to photographs taken with hand cameras by Dr. Berry and the author on various excursions, as well as 16 mm. monochrome and colour film taken by Dr. Ecke, 450 vertical photographs were taken on the aerial surveys with a K.17 aerial camera (focal distance 15.24 cm., size 22.9×22.9 cm.) at a height of about 300 metres, each picture covering an actual area of 457 metres square (25,000 square yards).

The quantitative evaluation of the aerial photographs, enlarged to 57×57 cm., was undertaken by a service unit of the R.A.F. and, above all, by Wing-Commander Dagger. Taking all the photographs together, there was about a 60% overlap of the areas. Naturally, a straight aerial course of 457 metres did not include all individuals in the area exposed, even apart from those which were on the edge of an irregular line of surf. Some of the photographs are only moderately good and, for example, some are over-exposed because of the reflection of the sun on the water, so that counting is made very difficult or almost impossible. For computation a transparent grid plane divided into half-inch squares was laid over each photograph, and in some typical squares the number of ducks were counted with the help of a magnifying glass. An average was then worked out and used in arriving at the estimated total. In general the estimates were probably rather on the low side than on the high side. For example, in section 1 of photograph 0166 each Shelduck was counted and it was found that there was a total of 12,118, but the estimate obtained by the method described came to only 9,050. The largest number of Shelduck, 15,300, appears on section 1 of photograph 0167 where each bird was counted. The estimated numbers of Shelduck on the forty-six photographs totalled 170,237. Because of the 60% overlap, however, the numbers obtained in each aerial photograph were multiplied by 40

and divided by 100. The final result of this calculation, which was as exact as could possibly be obtained, was thus 68,095.

As has already been stated, not all the Shelduck present were included in the photographs and so the Commission felt that there was considerable justification for its rough assessment of the number of Shelduck which were seen at one time on Grosser Knechtsand on 9th August 1955 as 75,000-100,000.

The biological evaluation of the aerial photographs resulted in some noteworthy data. Large stretches of dry sand or half-dry shore were favoured as resting places and were occupied to a depth of about 70 metres with a maximum density of 65-80 birds to 126 square metres. The identification of single Shelducks on the light sand was made much easier by the sharp shadows. When the photographs were taken, there was a large number of Shelduck in a long raft—which the measurements of the picture showed to be at least 3,449 metres long—immediately behind the surf in calm shallow water between it and the shore a few hundred metres away (plate 20). This raft had a minimum width of 10-25 metres and a maximum of 50-60. In compact sections there were 125 and 139 birds to 126 square metres and in sample sections with particularly high densities there were 180-210 to 126 square metres. In the evaluation of the aerial photographs of this raft of Shelduck a total of about 25,500 was estimated.

The aerial photographs are documentary evidence of resting places of more or less loose assemblages of swimming Shelduck (12-24 birds to the stated unit of 126 square metres) further out in deeper water, between 160 and 430 metres from the shore. Some concentrations were denser (147 birds per square unit) and one of these which was very spread out was most remarkable. It was probably the result of air currents, as the wonderful regularity of the curves formed by the small flocks outside the surf could only have been caused by a definite current pattern (plate 19b). The form of the dispositions of floating Shelduck is therefore probably a direct result of movement caused by wind drift and tide stream. When, as in these cases, there is visible movement of the position of the Shelduck even in calm water, how great and, in certain circumstances, dangerous is the effect not only of stronger ebb and flood tides but of stronger winds on these floating birds. These conditions must be borne in mind when the hazards of the Shelduck in the bombing practice area are considered. As on the first flight round Knechtsand and also on the twelfth survey (plate 19a) the majority were on dry sand, it is assumed that those in the belt and all the flocks on the deep water had only subsequently fled there.

Finally, the photographic material also included complexes, both on the shore and on calm water, of larger groups of Shelduck with a maximum density of 77 birds per square unit.

TE 18A. All taken on
chtsand, Germany, these
os illustrate the moult
tion in the Shelduck
arna tadorna). This one,
feathers already sprout-
was photographed on
August 1955 when there
near-peak numbers of
o birds (pages 106-115)



PLATE 18B. This bird was
photographed on the same
day as the one in plate 18a,
but it had yet to shed its old
and worn primaries. Of 27
caught on this day, seven
were only just losing their
old feathers, 13 entirely
lacked primaries and seven
had new feathers sprouting

EE 18C. This one was
six weeks later, on
eptember 1955, but its
athers were only just
ng and it was at least
s from regaining full
By this date only
birds remained, but
two-thirds of these
not fly (page 114)



PLATE 18D. Another on
the same day as the one in
plate 18c, but this had its
new feathers fairly well
developed. The moult lasts
about six weeks, but such is
the variation that the
moulting grounds may be in
occupation for as much as
three months (page 114)



PLATE 19. Moulting Shelduck (*Tadorna tadorna*), Knechtsand, August 1955 and 1956. Above, part of a concentration fleeing to the water when the aircraft went low (page 113) (*photo: F. Goethe*). Below, huge floating flocks driven into shapes by tide and wind (page 113) (*photo: R.A.F.*). Inset, typical depression trampled by Shelduck looking for food in shallow running water (*photo: F. Goethe*)

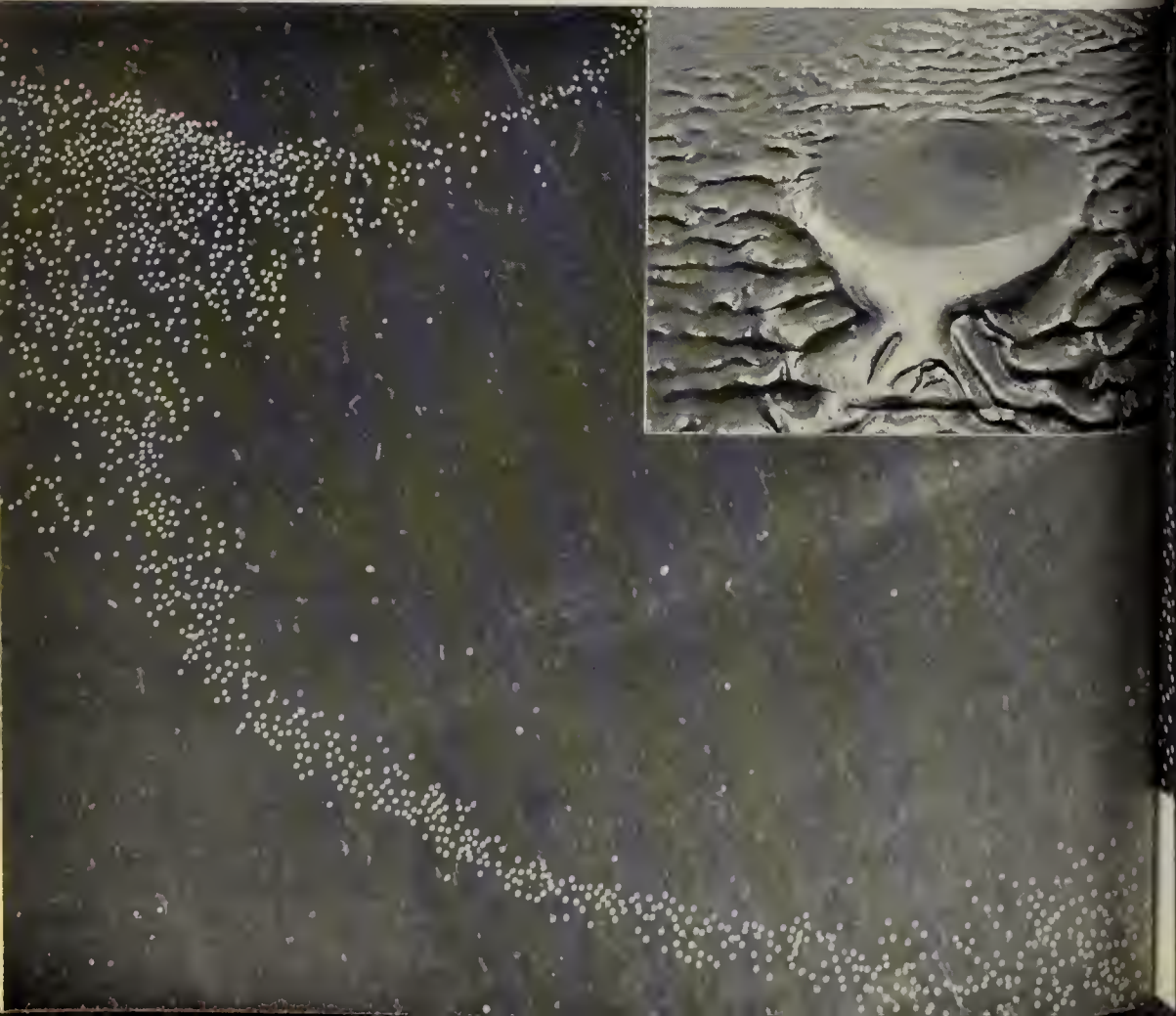




PLATE 20. Moulting Shelduck (*Tadorna tadorna*), Knechtsand, 9th August 1955. Part of a huge raft in calm water between the surf-line and the shore; the whole raft, two miles long and 10-60 yards wide, was estimated at 25,500 birds and here were some 70,000 altogether in the area that day (page 112) (photo: R.A.F.)



PLATE 21. Shelduck (*Tadorna tadorna*), Suffolk, July 1960. Above, adult female in worn plumage; below, juvenile. Adults moult body first, then wings and tail (when absence of black primaries distinguishes them at 300 feet, page 110); most migrate to the moulting grounds for the flightless period. Juveniles do not moult their flight-feathers and have a separate migration (photos: Eric Hosking)



More precise biological details are shown in the aerial photographs taken with the hand cameras, particularly on the twelfth survey. Here the direction of the various movements of the birds illustrates very clearly the conflict between the normal (probably instinctive) flight to water and the simultaneous urge towards high sand when the aircraft flew low. The generally slight reaction of the Shelduck to aircraft is, however, still evident. As a result of the flight into the water and the breaking of the light surf lines, the wave band formation already mentioned were produced; incidentally, these are also characteristic of floating Guillemots (*Uria aalge*).

On account of the height of the northern parts of the sand-banks and their resulting safety, the majority of moulting Shelduck generally stay on the north-western and northern sides during high water if the wind conditions are favourable. In other wind conditions some parties may seek the southern and eastern sides of Knechtsand, especially as these areas are muddy and richer in mollusc foods. The high parts of the sand, which remain dry at normal high water, contain hardly any animal food. When the birds concentrate there, one can see a subsequent dispersal to the lower flats as these are uncovered by the ebb tide.

There is no evidence of any decline in food intake during the moult, nor is this to be expected because, according to Prof. K. Lorenz (*in litt.*), Shelducks kept in captivity under natural conditions show no decrease in food requirements during the moult. Droppings found on the mud-flats or obtained from the captured Shelducks were analysed by Dr. W. Schäfer (Director of the Forschungsanstalt "Senckenberg" für Meeresgeologie und Biologie in Wilhelmshaven). The analysis yielded remains of young Cockles (*Cardium edule*), *Macoma baltica* (very numerous), Mussels (*Mytilus edulis*), *Nucula catena* or *cuculus* (very numerous), *Litorina litorea* (once) and *Hydrobia ulvae* (once). These molluscs were mostly digested into fine particles, being ground up and to a great extent decalcified; shell margins, hinges and columella were well discernible in the grits. There was no trace of any other animal food such as Crustacea, which is of importance in view of the contention that Shelducks cause harm to shrimps and prawns.

CONCLUSIONS

These aerial surveys of the sand flats of the Heligoland Bight show that the greatest concentrations of moulting Shelduck are on Grosser Knechtsand, although the vicinity of Trischen is also a most important moulting area. This had already been noticed by an officer of the R.A.F. on 23rd July 1955 and also recorded in the observations made during the eighth survey; in addition, ringing recoveries had indicated

that it was of importance (Hoogerheide and Kraak 1942, Goethe 1957). Data from the literature regarding Trischen as a moulting area are given in the separate paper which is to follow next month.

Judging from the literature, we feel completely justified in stating that Knechtsand is the most important moulting area for Shelduck in Europe. In 1955 Knechtsand was already occupied by a maximum number of moulting birds (100,000 or more) on 25th July and a large number (at least 75,000) was still recorded there between 9th and 12th August. By 25th September the total had decreased considerably (to 4,400), although Shelduck in full moult were still found (plates 18c and 18d). The moult had practically finished by the first week in October. It has not yet been proved by investigation, but one can assume that the grand total of Shelduck which come to Knechtsand in the autumn (from all over north-west Europe including the British Isles) is considerably higher than any of the figures mentioned because, again according to Prof. Lorenz (*in litt.*), the moult of this species takes only six weeks, even taking into consideration all the phases of lessened ability of flight, and the period during which moulting birds are present extends over three months.

ACKNOWLEDGEMENTS

The author once again expresses his thanks to all who contributed to the success of this undertaking, an undertaking which has been of the greatest value to international ornithological research and nature protection and which, by the evaluation of the aerial photographs, has demonstrated new methods of extensive avifaunal investigations. Thanks are primarily due to the British Air Ministry and personnel of the R.A.F. who made the large-scale aerial investigation possible, and especially to the Station Commander at Oldenburg, Group Captain D. C. Stapleton, for his great hospitality and ready help; also to Lieutenant Burch for his untiring support.

The author also wishes to thank all members of the Commission for giving him their various personal records. On behalf of the other members he offers particular thanks to the liaison officer, Wing-Commander the Rev. J. H. K. Daggar, without whose official services and ornithological enthusiasm the Commission could hardly have been successful. The great care and energy which he devoted to the development and evaluation of the aerial photographs has already been mentioned. Not least, the compiler would like to express his gratitude to the Secretary of the International Council for Bird Preservation, Miss Phyllis Barclay-Smith, for her tireless efforts in making the arrangements and for her translation of this report into English.

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Notes

Beetles in the plumage of birds.—On 25th May 1959 I picked up a freshly dead Swift (*Apus apus*) on the sloping concrete bank of Hilfield Park Reservoir, Hertfordshire. On examining the bird I discovered a single beetle of the species *Haltica oleracea* right in among the feathers of the upper breast; it was just over 2.5 mm. in length. This beetle is a plant feeder and, as it is capable of flight, I assume that it had collided with the Swift and become entangled in its plumage. It is most unlikely that it got on the bird after the latter's death for I have not otherwise found this beetle in the reservoir area, and no suitable food plants exist near that particular place. Dr. David Lack informed me that he had never heard of beetles being found among the feathers of the Swift or any other bird.

A second instance came to light, however, on 19th June 1960 when Mr. T. W. Gladwin trapped an adult male House Sparrow (*Passer domesticus*) at Digswell, Hertfordshire. Among the feathers of the upper breast was found a Staphylinid beetle just 2 mm. in length. This was identified for me by Mr. W. O. Steel as *Amischa analis*, a species normally found in moss. The Staphylinid beetles have considerable powers of flight and often occur in swarms. It may be that

the sparrow flew into a swarm of these beetles or, perhaps more likely, may have been collecting some moss for use as nest lining and thus picked up the insect.

I have been unable to trace any published references to this subject, which suggests that it may be of rare occurrence. However, it is unlikely that any other than very small beetles would be involved and these, being active insects, would no doubt drop off very quickly when a bird was being handled, thus tending to escape detection.

BRYAN L. SAGE

Attack and counter-attack between Great Black-backed Gull and Heron.—In January 1956 I saw a Heron (*Ardea cinerea*) flying across the reservoir at Abberton, Essex, with a large fish in its bill. A Great Black-backed Gull (*Larus marinus*) then appeared in pursuit and the Heron dropped the fish into the water. The gull promptly retrieved it and flew off, while the Heron went on to the bank about forty yards away. After the gull had gone a hundred yards or more, the Heron uttered several long-drawn and grating squawks (which gave the impression of extreme rage) and flew off after the gull which, to my surprise, it easily overhauled. A confused aerial skirmish then took place and the fish fell once more into the water, whereupon the Heron dropped to the surface and snatched it up again, while the gull flew off. The Heron made its way quickly to the bank and took cover under some willows. Although seven or eight Great Black-backed Gulls hovered over it during the five minutes or more that it took to swallow the fish, it now remained calm and unconcerned. I was particularly impressed by the Heron's apparent fury and its subsequent pertinacity in recovering its prey.

R. V. A. MARSHALL

[The lapse of time before the Heron reacted to the gull's original attack also seems interesting to us.—EDS.]

Golden Plover alighting on the sea.—On 28th August 1960, whilst I was travelling by steamer to Denmark and about 40 miles off Esbjerg, I noticed a Golden Plover (*Charadrius apricarius*) flying behind the boat. It settled on the sea and remained afloat until lost to view. The sea was calm and the weather misty. The bird may have been too exhausted to fly any further or perhaps resting on the sea is more regular than is recorded.

R. M. CURBER

Coloration of soft parts of Grey Phalaropes.—*The Handbook* describes the soft parts of the Grey Phalarope (*Phalaropus fulicarius*) as "Bill (ad. ♀) chrome-yellow, tip black, (ad. ♂) base yellow, rest black, (juv.)

grey-brown shaded to black tip; legs and feet horn-coloured; webs yellow" and those of the Red-necked Phalarope (*Ph. lobatus*) as "Bill blackish; legs and feet (ad. summer) dark blue-grey, (juv.) blue-flesh, webs yellowish". The *Field Guide* describes the Grey Phalarope as having a dark-tipped bill and yellowish legs and the Red-necked Phalarope as having an all-black bill and blackish legs. The following descriptions of the soft parts of two Grey Phalaropes recorded last autumn may therefore be of interest.

The first was seen down to ten feet in good light in a puddle on Southbourne cliffs, Hampshire, by J.H.T. on 9th October 1960. The bill was completely black with no trace of yellow or lighter shading of any kind. The legs were dark blue-grey with a trace of flesh colour on the feet. Otherwise the shape of the bill was typical of a Grey Phalarope and the back was a *very* pale blue-grey with no sign of streaking, contrasting strongly with the dark primaries both at rest and in flight. A second bird, injured and collected by E.C. at Keyhaven, Hampshire, on 10th October 1960—it died in the night—also had an all-black bill and its legs were partly blue-flesh and partly yellowish-horn. Moreover, the bill was exactly the same length as that in the sketch of a juvenile Red-necked on p. 222 of *The Handbook*, i.e. $2\frac{1}{2}$ mm. longer than in the sketch of a juvenile Grey on p. 217. Both birds, incidentally, had a *very* noticeable white wing-bar.

EDWIN COHEN and J. H. TAVERNER

[During the big influx of Grey Phalaropes in the autumn of 1960 several observers commented on birds with black bills and we believe this to be a normal feature of at least some of the population of this species. We are, however, very glad to publish this note because it draws attention to the slightly misleading statements in the textbooks. So far as we know, only one reference to Grey Phalaropes with black bills in winter plumage has been published in this country and that was by B. L. Sage in 1954 (*Bull. B.O.C.*, 74: 12). He concluded that at least a small percentage of adult male Grey Phalaropes have completely black bills in winter. It is certainly not safe to identify a Phalarope as a Red-necked because it has a completely dark bill in winter.—Eds.]

Little Gull preening in flight.—On 20th October 1960, at Lodmoor, Bournemouth, Dorset, I saw an immature Little Gull (*Larus minutus*) dive at one of the pools there. After several minutes of bathing and preening its upper-parts and wings on the water, it rose to a height of about twelve feet and preened its breast and flanks while in the air. It remained more or less over the same spot with gently beating wings, head to wind, but it had difficulty in maintaining altitude so

rose and fell several times in an attractive moth-like way. The preening was carried out most thoroughly for a minute or more before the bird drifted back with the wind, circled round and began preening again at about the original position. SYBIL M. BUTLIN

[Dr. I. C. T. Nisbet informs us that he has seen both Bonaparte's Gulls (*L. philadelphia*) and Black Terns (*Chlidonias niger*) preening in flight in a similar way and it may be that this behaviour is not unusual in the Laridae.—Eds.]

Black-headed Gulls taking acorns.—At Ebley, Gloucestershire, on 30th September 1960, I noticed seven Black-headed Gulls (*Larus ridibundus*) circling very low over the tops of a group of oak trees about forty yards from the road. One bird was seen to snatch an acorn, which was clearly visible in its bill until it swallowed it as it rose higher with another gull in pursuit. The position of the trees on a slope made it impossible to be sure how many were successful in obtaining the acorns and whether any perched momentarily, but when near the road all the birds made their attempts while remaining more or less stationary in the air, heads into the wind with beating wings and dangling legs, dipping their heads as they pecked at the clusters. None was seen to perch during the three or four minutes that they were watched.

There is a previous record of this species taking acorns (*Brit. Birds*, 48: 331), but in that case the birds perched to take the fruit. Black-headed Gulls have also been reported feeding on hawthorn berries in a very similar manner to that of the birds at Ebley (*Brit. Birds*, 50: 75 and 347). SYBIL M. BUTLIN

Woodpigeon displaying to Magpies.—On 9th October 1960, at Crediton, Devon, I saw a Woodpigeon (*Columba palumbus*) displaying to two Magpies (*Pica pica*). It was walking rather quickly, making pecking movements with its head and half-flapping its wings. Twice it approached to within about two feet of one of the Magpies, its wing-flapping becoming more intense as it did so, and then walked away as if trying to induce the Magpie to follow. The Magpies took very little notice of this performance. After about two minutes they flew away and, a few seconds later, the Woodpigeon flew up to a tall, thick elm hedge at the edge of the field and about ten yards away from where the action had taken place. In all probability it had a nest there, but as the hedge was on private ground where intrusion would have been resented I was unable to check on this.

S. G. MADGE

[Mr. Derek Goodwin has commented as follows: "I should very much have liked to have seen this. The description recalls the kind of behaviour that often takes place 'between rounds' when Wood-pigeons are fighting, i.e. approach and retreat, 'nodding', and intention-movements of hitting with the wings. The fact that the wing-movements increased as this Woodpigeon got closer to the Magpies also suggests this interpretation. I have seen fierce attacks on a tame Magpie by a female Turtle Dove (*Streptopelia turtur*) and a male Barbary Dove (*S. risoria*) that had young in nests near-by. It is a great pity that it was not possible to find out whether this Woodpigeon had young."—EDS.]

Concrete nest-boxes damaged by Great Spotted Woodpeckers.—In a previous note two years ago (*Brit. Birds*, 52: 270-271) I recorded some further examples of losses of nestling Blue and Great Tits (*Parus caeruleus* and *major*) through attacks on nest-boxes by Great Spotted Woodpeckers (*Dendrocopos major*). It has been suggested that it is the presence of (sound of) nestlings within the boxes which triggers-off these attacks; but it is now abundantly clear that the entrance holes are also enlarged by woodpeckers during the winter months, possibly for roosting. Having had to replace fifteen to twenty box-fronts which were ruined by woodpeckers, I went to the considerable trouble of importing an experimental supply of concrete nest-boxes from Germany. These have recently been described by Dr. H. Bruns (*Bird Study*, 7: 193-208) as having "an almost unlimited durability" and as being "secure against damage by woodpeckers". I erected some of these at Woldingham in Surrey and some at Possingworth Park in Sussex. Soon afterwards I saw Great Spotted Woodpeckers hard at work on them and decided, with considerable satisfaction, that the birds would either become neurotic with frustration, or would wear their bills down to stubs. But I have now discovered to my astonishment that during the winter months several of the concrete boxes have been damaged in both localities and that one has had the entrance hole enlarged by 75%. The German boxes are cast of an extremely hard and densely-bonded mixture of concrete and sawdust, about half an inch thick. The force required even to mark the surface seems beyond the capabilities of any bird, but my woodpeckers appear to have accepted the challenge with relish.

GUY MOUNTFORT

Induly prolonged fledging period of House Martin.—On the assumption that the figures of 19-22 days given in *The Handbook* as the fledging period of the House Martin (*Delichon urbica*) have not since

been amended, it may be of some interest to record that in the autumn of 1960 a brood of young House Martins spent a much longer time in a nest on the house where I reside at Stoford, near Salisbury, Wiltshire. The eggs in this nest hatched not later than 25th August, on which date the shells were on the ground below. Young were still in the nest on 25th September, but were not there on the 26th. Counting the first and last days, the fledging period thus amounted to 32 days.

W. M. CONGREVE

[It seems possible that this unusually prolonged fledging period may have been connected with the generally wet weather and resulting poor feeding conditions for insectivorous birds at that time. We should be glad to know of any other records of this kind.—EDS.]

Carrion Crow taking fish from river.—On the evening of 25th June 1960 I watched a Carrion Crow (*Corvus corone*) twice take a fish from the River Ouse near Turvey, Bedfordshire. The bird first alighted in a willow near the bank and then flew along the river about five feet above the surface. It hovered for a few seconds and then dropped quickly before rising with a fish in its bill. It did not appear to enter the water and it did not use its feet at all. The fish, which was about five inches long, was taken to some willows to be eaten and the bird then returned to catch a second in the same way. Both hung limply in its bill and it seems probable that they were dead before being taken.

D. P. FERRO

[There have been various previous references to Carrion Crows taking fish. Most of these have been similar to the above in that the fish (usually, but not always, apparently dead) were snatched up from the surface of the water while the birds were in flight (*Brit. Birds*, 40: 158 and 245; 41: 95 and 278; 47: 405; and 48: 91). There is also at least one case of a Carrion Crow alighting in shallow water to catch small trout (*Brit. Birds*, 44: 323).—EDS.]

Further sex counts of wintering Blackbirds.—In a previous study of the Blackbird (*Turdus merula*) we recorded a preponderance of males wintering in Britain in localities as far apart as Shetland and Hampshire (see *Ibis*, 94: 636-653). Various methods were used in collecting the figures—sight-records, complete census counts, trapping and bat-fowling—and they showed a satisfactorily close agreement, giving (excluding one acknowledged unreliable result, p. 650) a range of from 55% to 69% males.

Since then we have collected a further series of sight-record counts and these are given below. Again these all show a preponderance of males in winter. Males with yellow bills are given as "Ad. ♂",

NOTES

first-winter males with dark bills as "Juv. ♂", and when the bill was not seen as "? age ♂". No attempt was made to age the females in the field and this group includes all ages.

L. S. V. and U. M. VENABLES

Place and observer	Month and year	Proportions of sexes	Percentage of males
South Uist and Stornoway, Outer Hebrides (L. S. V. and U. M. Venables)	January 1954	Ad. ♂ 63 Juv. ♂ 54 ♀ 70	63.6
Orkney and Kirkwall, Orkney (L. S. V. and U. M. Venables)	January-February 1956	Ad. ♂ 43 Juv. ♂ 23 ♀ 39	62.9
Co. Mayo, Ireland (Major R. F. Rutledge)	December-January 1953-54	♂ 197 ♀ 99	66.6
Co. Kerry, Ireland (D. W. Snow)	January 1954	Ad. ♂ 112 Juv. ♂ 97 ? age ♂ 89 ♀ 255	53.9
Isle of Man (L. S. V. and U. M. Venables)	January 1956	Ad. ♂ 41 Juv. ♂ 36 ? age ♂ 17 ♀ 62	60.3
Anglesey (L. S. V. and U. M. Venables)	December 1960	Ad. ♂ 83 Juv. ♂ 49 ? age ♂ 6 ♀ 78	63.9
Dorsetshire (L. S. V. and U. M. Venables)	November-December 1955	Ad. ♂ 95 Juv. ♂ 51 ? age ♂ 18 ♀ 106	60.7
London squares and parks (S. Cramp)	December-February 1948-49 1949-50	♂ 462 ♀ 265	63.5

Rook somersaulting on wire.—On 1st November 1960, near Colchester, Essex, I saw a Rook (*Corvus frugilegus*) hanging upside down by its feet from high tension wires about eighty feet up. It appeared to be dead. Two or three other Rooks were perched on the same wire. I turned away and, on looking back a minute or two later, was astonished to see that the "dead" bird had vanished. Then, as I watched, a Rook slowly and deliberately leant forward and turned a

somersault round the wire, holding on to it all the time with its feet and flapping its wings about twice to pull itself upright again. It repeated this somersault slowly several times, pausing for a few seconds between each circle. Finally it went forward again and hung vertically downwards with its wings closed. It stayed in this position for two or three seconds, then dropped from the wire and flew back to it, after which it flew away.

The whole action was very amusing to watch and I had the impression that the bird was "playing". The wire was separated from adjacent ones by at least three feet, probably more, and the Rook could not possibly have made electrical contact. It was not stunned or injured in any way, but appeared perfectly well and in the intervals between somersaulting sat composedly. It flew quite normally.

R. V. A. MARSHALL

Wheatear feeding on blackberries.—On 18th September 1959, at Porlock Marsh, Somerset, D. Carr, K. Carr, P. Carr and I were watching a Wheatear (*Oenanthe oenanthe*) when it flew from the ground and settled on a large bramble (*Rubus*). It then proceeded to feed on the blackberries, leaning forwards and downwards in order to pull at them and at times beating its wings to maintain its position. It appeared to be selecting fully ripened berries which were, in fact, in particularly fine condition. There is no mention in *The Handbook of fruit forming any part of the diet of this species.* C. M. VEYSEY

[Dr. N. Tinbergen comments, "In 1932, in the Angmagssalik district of eastern Greenland, I often observed Greenland Wheatears (*Oe. oe. leucorrhoa*) feeding on crowberries (*Empetrum nigrum*) which they swallowed whole." Reference was recently made to both Black Wheatears (*Oe. leucura*) and Black-eared Wheatears (*Oe. hispanica*) feeding their young on berries in Spain (*Brit. Birds*, 53: 555).—EDS.]

Robin catching tadpoles.—On 14th May 1960, at Bohernabreena Reservoir, Co. Dublin, I noticed a Robin (*Erithacus rubecula*) standing on a stone at the edge of a small pool about three to five inches deep. While I watched, the Robin darted forward and took a tadpole from the water. The tadpole could be seen quite clearly, held by the head, as it struggled in the bird's bill. The Robin flew off with the tadpole into an adjacent hedge where young birds could be heard calling. After about ten minutes the Robin returned to the stone and took a second tadpole, this time by the tail. It flew to perch about three yards away from me and I could clearly see it pecking at the tadpole. After a few moments it again went to the hedge. Unfortunately I then had to move away.

A second Robin stayed in the vicinity all the time, joining the first on the stone, but it did not take any tadpoles, nor did it seem to have any interest in them.

GARRY DORAN

[In his *The Life of the Robin* (p. 124) David Lack refers to two comparable observations. In 1927 (*Brit. Birds*, 21: 260) R. Hudson saw a Robin taking minute roach from a garden pond, submerging its head to do so; and G. C. S. Ingram and H. M. Salmon (1934, *Birds in Britain Today*, p. 36) described a case of Robins catching minnows for their young from a brook which had nearly dried up. It is interesting that the second bird mentioned by Miss Doran did not apparently learn the trick.—EDS.]

Garden Warbler in Lancashire in December.—Late on the afternoon of 30th November 1960 I noted a warbler near the shore at St. Annes, Lancashire, but the light was too poor for identification. Next day the bird was observed by P. Carah, N. Harwood and myself, and found to be a Garden Warbler (*Sylvia borin*). Subsequently, it was seen many times by the same and other observers, including R. H. Wilson and L. Shorrocks, until last noted on 12th December. The locality was a small area of dunes colonised by sea buckthorn (*Hippophaë rhamnoides*), a few yards from the highest tide line and partially exposed to onshore winds. The fruits of the sea buckthorn, which are semi-liquid berries with hard interiors, were the only food the bird was seen to take, though this was not necessarily the entire diet since Blue Tits (*Parus caeruleus*) seem to search for insects among sea buckthorn and, in any case, the bird may well have obtained other food in some adjacent gardens which it visited on at least one occasion. It was never very active, seeming to feed only casually on the berries, and would sometimes allow observation from less than five yards.

It is of note that in the previous winter four Blackcaps (*S. atricapilla*) stayed at exactly the same place. These birds also fed on the berries of the sea buckthorn, but did so much more heartily and left only when the supply was exhausted.

K. W. CLEMENTS

Garden Warbler in Lincolnshire in January.—On 1st January 1961, at Sleaford sewage farm, Lincolnshire, I flushed four Meadow Pipits (*Anthus pratensis*) from a small sludge bed and then saw that they were joined by a warbler as they flew off. The five birds completed a wide circle and came back to feed, the pipits on the mud and the warbler amongst dead fibrous weed stalks and long grass. I was able to approach to within six feet of the bird and was surprised to find a Garden Warbler (*Sylvia borin*). It continued to feed on insects for half an hour until I left the area.

W. M. PEET

[Full descriptions of both these birds have been supplied. The two records are quite exceptional and we know of no previous December or January occurrences of this species in Britain. A note on the four Blackcaps mentioned by Mr. Clements follows below. Such a party seems unusual, though a considerable number of Blackcaps and Chiffchaffs (*Phylloscopus collybita*) were recorded in both winters, the former as far north as Sutherland, and some individuals of both these species now stay right through every year. Both Garden Warblers and Blackcaps commonly eat such berries as those of elder (*Sambucus*) in autumn.—EDS.]

Observations on a party of Blackcaps wintering in Lancashire.

From 6th December 1959 until 19th January 1960 a small party of Blackcaps (*Sylvia atricapilla*) was seen at St. Annes, Lancashire, by various observers including N. Harwood, K. W. Clements and myself. On 16th December I saw three males and a female. One of the males died on the 20th, but the other three birds remained for a further month. Except for brief excursions to private gardens, the Blackcaps occupied an unusual habitat of sea buckthorn (*Hippophaë rhamnoides*) in a hollow among fixed sand-dunes overgrown with marram grass. I sent the dead male to Bolton Museum where A. Hazelwood identified it as an adult. An examination of the stomach contents supported numerous field observations that the birds fed principally on the rancid-tasting fruit of the sea buckthorn. On many occasions the birds showed marked social tendencies, forming close couples or a compact group which kept contact without any sound being uttered. The three birds that were left survived severe gales and hard frosts, and departed only after Fieldfares (*Turdus pilaris*), Song Thrushes (*T. philomelos*) and Greenfinches (*Chloris chloris*) had stripped the thickets of berries.

P. CARAH

Spotted Flycatchers feeding young on honeysuckle berries.—On 6th August 1960, at Ashbourne, Derbyshire, I watched a pair of Spotted Flycatchers (*Muscicapa striata*) feeding their three young in the nest—it was their second brood—with the berries of a honeysuckle (*Lonicera caprifolium*) growing near-by. The adult birds were picking off the berries in flight without settling. The young left the nest that evening, but were still in the area next morning, when I again saw the parents feeding them on the berries. The honeysuckle was a fair-sized plant and moderately well sprinkled with fruit. It is hard to assess numbers, but I think the birds may have had about a hundred, or roughly three-quarters of the crop. I do not think they touched them at any other time apart from that evening and morning. The only reference in *The Handbook* to Spotted Flycatchers feeding in

this way states that the species "is said to take berries, such as those of rowan, in autumn".

KATHLEEN M. HOLLICK

Yellow-headed Wagtail on Fair Isle.—On 17th October 1960, on Fair Isle, Peter Davis had a brief view of a bird that flew directly across his path and away out of sight. It was clearly a wagtail with a pale grey back and he formed the opinion that it was a Pied/White Wagtail (*Motacilla alba*). The following day G. Barnes found the bird near the same part of the island and had brief glimpses as it flew away. He also thought that it was *M. alba* until he heard its call which he described as similar to that of a Yellow Wagtail (*M. flava*) but distinct in that it was rather more drawn out. The bird was very wild and could not be found again that day. On the 22nd, however, I came across it feeding in a wet ditch less than a hundred yards away from where it had been seen on the two previous occasions. I was able to watch it for about ten minutes, at ranges down to twenty feet, and obtained the following detailed description:

Upper-parts: forehead pale grey; crown grey; nape dark grey; superciliary complete and pure white, broader behind the eye; ear-coverts pale grey; rest of upper-parts uniform pale dove grey, darker on rump. Prominent double wing-bar pure white; tail black in centre with white outer feathers, as in other wagtails. *Under-parts:* chin white, breast slightly buffish with a few spots on each side, suggesting the last traces of a pectoral band; flanks washed pale greyish; belly and under tail-coverts pure white.

In flight and on the ground from behind the general impression was of a White Wagtail, the uniform pale grey back immediately suggesting this species. In flight the double white wing-bar was conspicuous, but the feature attracting most attention was the very distinctive call. My first impression of this was that it suggested the call of a Yellow Wagtail, but, like G. Barnes five days earlier, I noted it as being distinctly different, rather shriller and more drawn out. On the ground the most noticeable features were the clean-looking effect caused by the pure greys and whites in the plumage, the prominent white eye-stripe and at some angles the greyish wash on the flanks. There was complete absence of olive or yellow in the plumage and the only trace of a brown colour was the faint buffish wash on the breast. In view of the call note I thought at first that the bird was an immature of one of the races of *M. flava*, though a number of points seemed most unusual. In particular, the uniform pale grey on the crown, ear-coverts and upper-parts, the prominent eye-stripe, the pure white under tail-coverts and conspicuous wing-bars, and the complete absence of yellow aroused my suspicions that this must be another species. By comparison, an immature *flava* seen at close range twelve

days earlier had looked a dull and scruffy bird, lacking in any distinctive features. Later, the paper by Kenneth Williamson and I. J. Ferguson-Lees on "Plumage and structural characters in the Yellow-headed Wagtail" (*Brit. Birds*, 48: 358-362) appeared to rule out any possibility of its being a first-winter individual of any of the forms of *M. flava*, including *thunbergi* and *simillima*, and I concluded that it was indeed a Yellow-headed Wagtail (*M. citreola*). B. S. MILNE

[This constitutes the third record of this Siberian species in Britain, the two previous ones having been ringed at Fair Isle on 20th September and 1st October 1954 (*Brit. Birds*, 48: 26-29).—EDS.]

Reviews

Atlas of European Birds. By K. H. Voous. Nelson, London, 1960. 284 pages; 419 maps and 355 photographs. 70s.

One of the post-war developments in ornithology has been the attention given to bird distribution. There has been a growing realisation of the value of maps, not only for a truer appreciation of the geographical ranges of birds, but also for a better understanding of relationships between species, of certain of their requirements and adaptations, of their spreads and, indeed, something of their histories. Now in this atlas (an English edition of *Atlas van de Europese Vogels*, published in Holland earlier in 1960) we have for the first time a book devoted primarily to maps, a splendid production and the finest presentation of distribution maps that has yet been achieved. There are separate maps for each of the 419 species found breeding regularly in Europe, and these include birds with such restricted distribution west of the Urals as Sociable Plover, Pallas' Sea Eagle, Oriental Cuckoo, Black Lark and Rubythroat.

An important feature, involving much research, is that breeding range throughout the world is shown for all the species covered. This is generally indicated by colouring red the land areas concerned, so that distribution in the main is very apparent, but in the cases of small islands or isolated colonies the red dots on the maps are sometimes smaller than a pin-head; nevertheless, one can learn, for example, that Oystercatchers nest on the Juan Fernandez Islands off the coast of Chile. Drawn to a scale little smaller than that used in *A Field Guide to the Birds of Britain and Europe*, each map covers either the whole of the northern hemisphere at a size of $8\frac{3}{4}$ inches by $3\frac{1}{4}$ inches or (if the bird's range penetrates the southern hemisphere) the whole world.

It is very instructive to see distribution portrayed thus in its global context. It shows, for example, how small are the total breeding areas of several of the typical Mediterranean warblers and how remarkably disrupted are the distributions of such species as the Twite, Azure-winged Magpie and Corsican Nuthatch.

In the preparation of the English edition 138 maps were amended and the information is right up to date, showing the Collared Dove breeding in eastern England and Scotland and giving a text reference to the 1960 nesting of the Osprey in Scotland. However, when poring over the maps, one notices some details which are incorrect. For example, the Arctic Skua is shown as nesting in Argyll, while the Great Skua is not marked anywhere on the Scottish mainland; the Hen Harrier is shown in substantial areas of England and also in parts of Wales, while Montagu's Harrier is illustrated as everywhere in England and Wales except the extreme north-west. The breeding areas in southern Spain of the Pintail and the Gadwall are omitted. Perhaps the red area in south Norway on the Barnacle Goose map is unintentional. In Greece many species are denied the ranges given them by A. Lambert in *The Ibis* in 1957 (99: 43-68), and the Spur-winged Plover is excluded from the book altogether. Back in this country, the Ring Ousel is shown as breeding in Norfolk and Kent, the Gull-billed Tern in Essex and the Short-eared Owl in Ireland, but no Redwing anywhere in Scotland, nor Bee-eater nor Black-winged Stilt in England.

These and other examples suggest some inconsistency, but unfortunately the author does not say by what principles he has been guided in preparing the maps, nor whether sporadic breeding is intended to be included. It seems clear that British ornithologists were not closely consulted. However, the detail is often better than that in the *Field Guide*, and too much attention need not be paid to such small effects as there are; the finer points of distribution—which itself varies from year to year, especially near the limits of the range—are often so much a matter of local or individual knowledge that probably two people working independently would produce identical maps. The maps refer to breeding areas only, and give no indication of range in winter or on passage. These aspects are touched on in the accompanying text which generally devotes some 300-400 words to each species. Requirements of habitat, food and nest site are given; the problems of closely related forms are discussed; details of past spread are often mentioned and origins considered; and in some cases the author looks into the future, as when he says that the Mediterranean Black-headed Gull is probably in the course of becoming completely extinct. The view-point is unusual and stimulating, and distribution is the focal point throughout.

Not the least attractive part of this work are the photographs. There are 355 of these, illustrating the majority of the species dealt with. Many of them are from Continental sources and include species of which photographs are seldom seen in this country; they form an outstanding collection of some of the best work of Europe's best photographers.

Dr. Voous is to be congratulated on having produced one of the more important ornithological books of recent years.

P. A. D. HOLLAND

Bird Photography as a Hobby. By Eric Hosking and Cyril Newberry. Stanley Paul, London, 1961. 95 pages; 33 photographs. 12s. 6d.

The principles of the practice and techniques of bird photography are now generally understood, but with the constant advances made by the photographic industry, and the multiplicity of cameras and materials available today, the beginner is understandably bewildered and in need of guidance. For this task none can be better qualified than the two experienced authors of the present book—which, in fact, brings up to date their earlier *The Art of Bird Photography*, published in 1944.

At that time, high speed electronic flash was, at least in this country, in its infancy; colour materials were almost unobtainable; and the 35 mm. camera had not made any very great impact on bird photography. Today electronic flash has passed the stage where it was used chiefly for the spectacular result and it is now incorporated as a valuable ally into straightforward bird photography (in this evolution nobody has played a bigger part than Mr. Hosking). The increased speed of modern colour-film has simplified many of the problems associated with its use when it first became readily available—the need for long exposures and often, as a consequence, very little depth of focus. Finally, the miniature camera has come into its own, not only because of improved equipment, but also because there has been a movement away from the studio portrait at the nest to photographs of birds going about their daily lives, in flight, etc. In one respect, however, time and all the modern advances have brought no change. Where the detailed portrait of a bird is required, there is still no equipment to beat the heavy, old-fashioned field-camera, such as was in use at the beginning of the century. As the authors rightly point out, a large original image on the negative is essential for this purpose. Throughout they again and again stress the golden rule for all successful bird photography, whether the apparatus be large or small—rigidity of camera. How often has a big outlay on cameras and equipment been negated by regarding the tripod as of minor importance? Tripods cannot be too sturdy for this work and it is to be hoped that all

beginners, and older hands, will read, mark, learn and inwardly digest the authors' constant emphasis of this point.

The photographs are utilitarian in that they illustrate points made in the text. They do this admirably, but the plate showing a Golden Eagle at its eyrie has been over-enlarged at the expense of definition.

The title refers to bird photography as a hobby. Some today regard it with misgiving, owing to the disturbance which it causes at the nest. With very rare birds and inexperienced photographers there may be some justification for this attitude, but the fact remains that it is a most enthralling and healthy pastime—field sport, I would prefer to call it. It has all the excitement of the chase, yet takes no life; it calls for many excellent qualities; and its results give pleasure to others and encourage widespread interest in conservation and bird welfare. It is to be hoped that this book will lead many of the younger generation to take up its practice. Certainly they will have to look for better advice.

G. K. YEATES

Letters

Arnold Boyd Memorial

rs,—You will have seen the recent announcement in the national press of the Nature Conservancy's acquisition of Rostherne Mere in Sheshire. It was largely due to the devotion of the late A. W. Boyd that the late Lord Egerton of Tatton was persuaded to bequeath Rostherne Mere for permanent preservation as a nature reserve and refuge for wildfowl.

Under the auspices of the Manchester Ornithological Society, and with the full approval of the Nature Conservancy, it is proposed to use funds to build an observation hut overlooking the mere as a memorial to Arnold Boyd, who did so much for ornithology, not only at local level but also on a national and international scale. His work in watching over and recording the natural history of the mere for so many years must now be carried on by other naturalists who will wish to recognise their deep indebtedness to him.

The target is £750, which it is thought will be adequate for the erection of a suitable hut. In addition, it is hoped that sufficient will be raised to equip the hut with some furniture and reference books, but this will depend upon the success of the appeal. Donations should be sent to the Honorary Treasurer, Manchester Ornithological Society, c/o Messrs. Henry Erin & Co., 11 Albert Square, Manchester 2.

STUART SMITH (*President*), J. H. RATHBONE (*Chairman*)
and T. HEDLEY BELL (*Honorary Secretary*)

[We welcome the opportunity of supporting this appeal and hope that it will receive a generous response from the subscribers to this journal, for which Arnold Boyd did so much.—EDS.]

Records of Radde's Bush Warbler and work in the Camargue

Sirs,—The interesting paper by Irene Neufeldt (*Brit. Birds*, 53: 117-122) On Radde's Bush Warbler (*Phylloscopus schwarzi*) notes only two European records and omits the one trapped at the Station Biologique de la Tour du Valat in the Camargue, France, in October 1957 (*Oiseau*, 28: 83-84).

The Camargue has long been known as an ornithological centre and a general outline of the vertebrate ecology of the region was, of course, given in this journal by Dr. L. Hoffman in 1958 (*Brit. Birds*, 51: 321-349). Nevertheless, the work carried out at la Tour du Valat, and even the existence of the research station there, is often overlooked. Perhaps, therefore, you will allow me to say that the Camargue's annual ornithological report, published by J. Penot in *La Terre et la Vie* (the journal of the Société Nationale d'Acclimatation), is but a brief résumé of the year's observations. A large amount of detailed information is kept in the station's files and Dr. Hoffmann, the director, is keen that it be utilised in, for example, distribution studies and statistical research into measurements and weights. Dr. Hoffmann and his staff cannot be expected to deliver long general reports, but special enquiries have been, and will continue to be, welcomed and answered. A case where the station's records would have helped fill a gap in the information on France was the irruption of tits in 1957 (see *Brit. Birds*, 53: 102).

Reference has recently been made by G. Mountfort (*Brit. Birds*, 53: 193-199) to the opportunity, and need, for ornithological work in France, and it is hoped that visitors to the Camargue will be good enough to send their observations, especially of migrants and the rarer nesting species, to the station so that the scope of ornithological activity in the region can be widened. Its full address is Station Biologique de la Tour du Valat, Le Sambuc, Bouches-du-Rhône, France.

P. HOPE JONES

Black-headed Gulls eating hawthorn berries and acorns

Sirs,—Two notes on Black-headed Gulls (*Larus ridibundus*) eating hawthorn berries have already appeared in *British Birds* (50: 75 and 347). Both related to north-west England. It is therefore particularly interesting to point out that the late C. D. Robinson observed Black-headed Gulls taking hawthorn berries in exactly the same way near

Keighley, west Yorkshire, on 22nd August and 17th October 1954 (*Yorkshire Naturalists' Union Orn. Report 1954* and MS. notes in the Keighley Museum). In the event of the birds' behaviour becoming widespread and habitual, it will be important to trace its regional origin; hence I think it advisable to bring this record to wider notice.

For the same reason I think it worthwhile to indicate a note on Black-headed Gulls eating acorns (F. Jefferson, *Y.N.U. Orn. Report 1952*). This observation, made in east Yorkshire in October 1952, antedates by two years the Hampshire record in *British Birds* (48: 331).

K. G. SPENCER

[Another note on Black-headed Gulls taking acorns, this time in Gloucestershire, appears on page 118.—Eds.]

Requests for information

Grey Wagtail movements.—A previous request (*Brit. Birds*, 53: 140) for information on coastal and inland movements of Grey Wagtails (*Motacilla cinerea*) is now repeated. The intended analysis of the migrations of this species is specially concerned with the years 1956-60, but all observations are of interest and will be duly acknowledged in the event of publication. Data should be sent to J. T. R. Harrock, Ecology Research Laboratory, Botany Department, University of Southampton.

Field investigations of the B.T.O.

The status and food of the Peregrine.—The recent controversy over Peregrines (*Falco peregrinus*) and racing pigeons, in the press and on television, has shown the need for up-to-date and reliable information on the numbers and distribution of the peregrine and on its feeding habits. At the request of the Nature Conservancy, the British Trust for Ornithology is therefore carrying out an impartial census of breeding Peregrines in Britain and Ireland in 1961. It is also intended to collect data on nesting success and food, and on the numbers of non-breeding birds, but the census is the primary aim. To make this as complete as possible it is essential that all the various interests co-operate and the Trust hopes that falconers, gamekeepers, ornithologists (including both oologists and bird protectionists) and the racing pigeon organisations will all contribute. The Trust wishes to make it clear that it is an impartial body and that the enquiry is on a fact-finding basis. The details of the information, particularly of nest sites, will be treated in strict confidence and will be available only to the organisers, who are Dr. D. A. Ratcliffe and I. J. Ferguson-Lees, and to those officials of the Trust who are connected with the enquiry. No actual site will be disclosed to any other person or body and the individual records will not be used against the interests of those supplying them, whether these be falconry, oology, bird protection or pigeon racing. Anyone who can help at all (even by checking just one cyrie) is asked to write for fuller details to Dr. D. A. Ratcliffe, c/o B.T.O., 2 King Edward Street, Oxford.

breeding season census of common birds.—This enquiry is being launched, also at the request of the Nature Conservancy, to investigate the status of about a dozen common species in a variety of typical habitats. The information is required primarily as a basis for studying the effects of toxic chemicals on bird populations and it is intended that the census should be continued for several years. The areas

to be covered should be as homogeneous as possible and preferably parts of larger areas of the same types. Examples of the minimum sizes which will give useful results are: about 200 acres of mixed farmland with large fields or of open downland or upland pasture; about 100 acres of parkland or of farmland with small fields; about 50 acres of open woodland; about 20 acres of woodland with secondary cover. The census is to be based on singing males, the aim being a complete count and NOT a transect. An absolute minimum of four counts between 1st April and 15th June is required and six visits should be made if at all possible. Anyone willing to assist (with the hope of being able to carry on for not less than three years) is invited to write to the Secretary, B.T.O., 2 King Edward Street, Oxford.

Sample census of Mute Swans.—In conjunction with the B.T.O., the Wildfowl Trust is conducting a census of Mute Swans (*Cygnus olor*) in 1961 in a limited number of counties. These have been chosen for their large populations of this species or because the cover was good in the previous census in 1955 and 1956. The extent of any change since then should thus become apparent. The census will be carried out in April and May and will be concerned with (a) occupied nests and broods, (b) non-breeding pairs holding territories, and (c) non-breeding herds. The counties involved are (in England) Buckingham, Cheshire, Devon, Essex, Kent, Leicester, Lincoln, Greater London, Norfolk, Northumberland, Oxford, Shropshire, Somerset and Wiltshire, and (in Scotland) the Lothians, Kinross, Fife and Stirling. Evidence is also wanted for or against Mute Swans causing damage. Anyone prepared to assist is asked to contact Dr. S. K. Eltringham, The Wildfowl Trust, Slimbridge, Gloucestershire, and occasional records should also be sent to this address.

Status of the Stonechat.—The Stonechat (*Saxicola torquata*) is generally considered to be declining in Britain. An enquiry is therefore being launched to ascertain the present breeding distribution and, if possible, to discover the reasons for the decline. It is hoped that all who visit suitable localities will send reports to J. D. Magee, 68 Bushey Mill Lane, Watford, Hertfordshire. Negative records are as important as positive ones, particularly from areas where the species formerly bred.

Numbers of Little Gulls.—The increase in the Little Gull (*Larus minutus*) in Britain is being studied by B. Neath, 1 Newcarth Road, Walkden, Manchester. He would welcome all records, particularly regular counts in favoured areas, giving the proportions of adults to immatures wherever possible. Records from previous years would also be valuable, as would notes on behaviour and migrations.

Notice

XIII International Ornithological Congress

The XIII International Ornithological Congress will be held at Cornell University, Ithaca, New York, U.S.A., from 17th to 21st June 1962—the first time such a congress has been held outside Europe. The President is Professor Ernst Mayr. Anyone wishing to receive further announcements and a membership application form should send name and address by 1st February 1962 to the Secretary-General, Professor C. G. Sibley, Fernow Hall, Cornell University, Ithaca, New York, U.S.A.

“Recent reports and news” has had to be held over, but it is hoped to include a detailed summary of the winter’s records in the April issue.

Some reviews of

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Edvard K. Barth
(with five plates)

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R. B. Treleven

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of identification

Peter Davis

The moult gatherings and moult migrations of Shelduck
in north-west Germany

Friedrich Goethe

Recent reports and news

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April
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Photographic Editor: Eric Hosking

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PLATE 22. Wood Sandpiper (*Tringa glareola*) brooding chick and eggs while lifted two feet in the air, Norway, June 1951 (page 136) (photo: Edvard K. Barth)

British Birds

Vol. 54 No. 4

APRIL 1961



The tameness of some Scandinavian waders

By *Edvard K. Barth*

(Plates 22-26)

IN THE YEARS 1946 to 1952 I met the Dotterel (*Charadrius morinellus*) a number of times on the ridges around the bird sanctuary of Fokstumyra on Dovre Fjell, Norway. In this part of Scandinavia the species nests chiefly between 3,600 and 4,500 feet above sea level. As soon as the female bird has laid her eggs she leaves her mate to incubate them and also to rear the young. Several female Dotterels usually band together and, without responsibilities, roam around in the alpine zone.

There are few birds better equipped with complete natural camouflage than the Dotterel. You are walking across some level stretch of mountain covered with reindeer lichen, small tufts of grass, patches of heather and moss-covered stones. No particular object catches your attention in the uniform cover in front of you. Suddenly you give a start, as a bird flies up almost from under your feet. You nearly trod on it. At the same moment you discover three eggs in a slight depression, only just left by the bird. That was the male Dotterel.

But he will fly only a few feet, and then he starts limping across the moss-covered ground, splays out his tail feathers, feigns injury and tries to fly with only one wing. Just follow him for fifteen or twenty yards, though, and then you can sit down quietly on a stone and wait. If you sit still and keep your eye on him, he will quite soon go back to his eggs. If you did not chance to discover the nest when he took off, he will now lead you to it.

Some Dotterels are even tamer and more trusting than others (plate 26). One important factor influencing their behaviour is the stage reached in incubation. If incubation has just started you cannot approach the bird as quickly and as easily as when the eggs are close to hatching. At this latter stage, if you lie down by the nest, put

your hand in the nest depression and put the eggs in your hand, it will not be long before the bird comes and lies down quietly and trustingly in your hand and starts incubating; then the most important thing is to keep the hand motionless. The most successful time for this is during the first hours after the young have hatched. Should the weather be cold at this period, and especially if there is some rain too, the Dotterel will be so attached to his nest that you can hardly scare him away.

On 3rd July 1951 I discovered a Dotterel sitting on his nest; shells from three hatched eggs encircled him about two inches from his body. It was still only a few degrees above freezing. When we were within a yard of him the bird started up, ran away from his nest and feigned injury. This lasted only a short time, however, and after five or ten minutes I could take pictures of him at a distance of one foot. The three young were completely dry.

Fifteen minutes after our arrival at the nest my wife picked up the young and, holding their legs tightly between her fingers, lowered her hand into the nest depression. A couple of minutes later the bird came and lay down, covering the young in her hand. He was remarkably untroubled, and my wife could lift the whole family a foot or two from the ground without his flying off (plate 26c). The young were already quite good at walking and did not appear to freeze. They tried several times to wander away from the nest but each time they were called back by the anxious father. We stayed there for all of an hour. My wife lay for long periods talking to the bird, keeping her head only five or six inches from him, sometimes actually touching him with her face, and he remained quiet and trustful.

I have only once met an angry Dotterel. He was apparently just as tame as others we had seen, but he was more excitable and restless, and suddenly he flew up in the face of my wife, who was lying beside him and talking to him. She only just succeeded in protecting her face with her hand, and after this experience she was more cautious. This bird repeated the attack several times and behaved in a decidedly less friendly manner than other Dotterels I have met.

Another of the very tame mountain birds is the Red-necked Phalarope (*Phalaropus lobatus*). In this part of Norway its breeding range extends from about 2,000 to 4,000 feet above sea level, that is to say from the upper coniferous zone, through the whole birch belt, up into the alpine zone. A nest may lie alone, close to a mountain pond, but frequently you can find several nests at the same place. I have observed colonies of as many as thirty birds. In this species, too, the females leave incubation and care of the young entirely to the males. The eggs generally hatch about the last week of June, but the time can vary considerably.

My most pleasurable meeting with a Red-necked Phalarope occurred on 4th July 1951. We discovered him when he left a tussock three or four yards in front of us. At first he seemed rather shy, but after staying from 10 a.m. to 3 p.m. I was able to take some pictures of this phalarope on the nest from a distance of one yard. At that time three of the eggshells were cracked. When we paid a short visit to the bird at 7 p.m. there were three half-dry young in the nest.

The next day there were three dry, active young in the nest, together with one egg which was pretty certainly infertile. The bird was still a little shy at first, but after we had been there for a couple of hours my wife could sit down on the nest tussock while he came back and covered the young (plate 23a). The chicks were extremely small, weighing 3.55, 3.45 and 3.2 gm. In other words, the biggest weighed only about one-eighth of an ounce. They were good walkers, and when placed on the water swam rapidly around. However, the water was very cold and the young started to freeze, so we put them back in the nest, where the father immediately came and warmed them.

After a while my wife took the young in her hand and placed it in the nest depression. A few minutes later the careful father came back and settled down on his young (plate 23b). She lifted her hand eighteen inches or two feet from the ground and put it down again without his taking off. As is usual with phalaropes, his movements were restless and nervous, but from the moment he decided to stay in the hand he was even more trusting than a Dotterel. A couple of times when he came swimming up and wanted to reach the nest tussock, my wife drove him off. At this, he became quite aggressive and flew so violently at the edge of the tussock that my wife had almost to dash him away.

Another wading bird to be found in the bogs of the mountain forests is the Wood Sandpiper (*Tringa glareola*). In the central mountain regions of Norway he has his nest between about 2,000 and 3,800 feet above sea level. The eggs of this bird, too, hatch in the last week of June. The Wood Sandpiper is generally shy and nervous. Very seldom can you meet one which allows you to make a close approach. The first time I managed to get near one was on 22nd June 1951, at Inna Lake, not far from Rondane. I was walking across a bog when a Wood Sandpiper suddenly ran out from a grass tussock just in front of me. He stopped a yard or two away and started jerking his tail without making a sound. I retreated a couple of paces and the bird immediately went to the tussock and settled down on his four eggs, three of which had pronounced hatching cracks. It was 6 p.m., so I took a few pictures from a distance of two yards and then left him. The next day, the 23rd, it never stopped raining. On the 24th we arrived at the Wood Sandpiper's nest by 5 o'clock in the morning,

in passable weather. We were in close contact with the bird for twelve hours. In the course of this time all the eggs hatched, and each time the bird took the empty eggshell in his beak and flew away for about fifteen yards. There he alighted, dropped the shell and flew straight back to the nest. For a time there were five of us either sitting or standing by the nest, and the bird walked peacefully among us. I must admit that every now and then he started scolding. He also made a few short flights, alighting in the top of some small tree and calling.

No doubt this was the male. In this species it is again the male that is most concerned with the care of the offspring. But in contrast to the Dotterel and the Red-necked Phalarope, the Wood Sandpiper always has his mate close at hand. The female also participates a little in the incubation. When this male called more intensely than usual, he was frequently answered by his mate farther out in the bog. It also happened more than once that the female came flying to the nest. Her colour pattern was more eye-catching than his. This female was also considerably tamer than is common with Wood Sandpipers. She sometimes risked coming as close as a couple of yards from us when we were sitting by the nest.

When the first young one had hatched, my wife put it, still wet, and the three eggs, each ready to hatch, in her hand in the nest depression. The male Wood Sandpiper stepped nervously around for a minute or two. He scolded a little and stooped down and pecked her hand a few times. After a short time, however, he stepped on to her hand, shoved the eggs and the young bird underneath himself and lay quietly down to warm them there (plates 24-25). It was not long before the bird was completely accustomed to the alteration in his living quarters and my wife could lift her hand eighteen inches into the air without his flying away (plate 22). With no difficulty at all we took this confident bird and ringed him.

Notes on the Peregrine in Cornwall

By R. B. Treleven

DURING THE COURSE of a study of the Peregrine (*Falco peregrinus*) in Cornwall, I have been struck by an apparent marked decline in the breeding success of this species in recent years; there has also been a considerable fall in the number of occupied nests. In these notes the Peregrine's status in Cornwall in the fifteen years after the 1939-45 war is compared with that in the ten years up to 1939, and some suggestions to account for its decline are made; notes on prey are

NOTES ON PEREGRINES IN CORNWALL

TABLE 1—BREEDING SUCCESS AT FOUR PEREGRINE (*Falco peregrinus*)
EYRIES IN CORNWALL, 1930-39

Year	Eyries occupied	Eyries vacant	Eyries successful	Young fledged
1930	3	1 ?	3	9
1931	2	2 ?	2	4
1932	4	—	2	5
1933	2	2	2	4
1934	4	—	3	8
1935	3	1	2	5
1936	4	—	4	9+
1937	3	1 ?	1	1
1938	4	—	3	6
1939	4	—	2	5

also included. It should be added that this is an interim report on work which is still in progress. It is submitted now because of the general interest in this species at the present time.*

1930-1939

Bannerman (1956) states that Cornwall is probably numerically the strongest English county for Peregrines and that it was reputed to possess upwards of twenty tenanted eyries in pre-war years. I have the location of exactly twenty eyries, but, as breeding Peregrines are often carefully guarded secrets, there could well be more, though I have made a close check with the records of the Cornwall Bird Watching and Preservation Society. The term "eyrie" is here used to denote the nesting cliff, but this may consist of three or four alternative sites all within the space of a few hundred yards. The eyries are all on the coast and their distribution is as follows: north, 16; south-west, 3; south, 1. The north coast is clearly the most suitable habitat.

Ryves (1948) gives a clear picture of the breeding success at a limited number of eyries before the war. The results are summarised in Table 1. The number of eyries he watched is but a fifth of the Cornish total, but it can be seen that the success rate was high at that time, at least in this sample. Of the thirty-three occupied eyries watched in the ten years, twenty-four produced young and at each successful eyrie an average of 2.3 young reached the flying stage. In all, fifty-six young Peregrines were recorded as having taken wing at these four sites during 1930-39.

*We take this opportunity of drawing attention to the enquiry into the status and food of the Peregrine, which is being organised now by the British Trust for Ornithology at the request of the Nature Conservancy. A notice about this enquiry has been published in *British Birds* last month (54: 131). Anyone who can help is asked to write for fuller details to Dr. D. A. Ratcliffe, c/o B.T.O., 2 King Edward Street, Oxford.—Eds.

1939-1945

During the war Peregrines were destroyed under a government order. All known eyries were "visited" and the birds shot where ever possible. I know of no records of Peregrines breeding in Cornwall from 1941 to 1945.

1946-1960

In 1946 at least one pair of Peregrines bred (Ryves 1948); in 1948 many of the old eyries were back in use and by 1955 seventeen eyries were in regular occupation. In 1958, however, the picture changed and I was unable to find a single successful eyrie between Hartland and Newquay. Formerly there had been eight in this stretch and seven of these had been successful in post-war years. In 1959 Mr. R. Khan was making a survey of the eyries south of Newquay and I was able to add his data to mine, thus viewing the whole Cornish picture. Of the seventeen eyries which had been in regular use in a number of post-war years, only seven were still occupied and only two produced young in that year.

In 1960 the situation was even worse. Seven eyries were occupied early in the season, but by 1st June only three pairs were still present. One eyrie produced two young. At another one immature bird was seen in July, but the actual site was not discovered though the adults were seen in the area throughout the breeding season. At the third eyrie no breeding took place.

Reverting to the stretch between Hartland and Newquay, which I had chosen as the most suitable for detailed study, I have set out below the "case history" of each of the eight recorded eyries:

Eyrie 1

1954 One cyass flew

1955 Two cyasses flew

1956 Three cyasses flew

1957 Falcon observed sitting but no young produced

1958 As 1957

1959 No serious attempt to breed but pair present throughout season

1960 As 1959 but birds seemed much less inclined to return to cliff face if disturbed. This eyrie was certainly in use before 1914 and possibly may be one of the really old breeding cliffs. The area is not easily accessible to the public. In 1957 and 1958 a second female was seen at the eyrie before the failure of the falcon to hatch.

Eyrie 2

This eyrie has not been successful since the war and the area is now much frequented by holiday-makers, but in 1952, 1953 and 1954 birds were present early in the season.

Eyrie 3

This was known before 1939, but since the war it has been used only in the early

1950s, and for the last five years it has been vacant. Buzzards bred successfully within a few yards of the old site in 1959 and 1960.

Eyrie 4

- 1957 Three young reared but two believed taken by Fox within a couple of days of leaving the eyrie
- 1958 Falcon sitting in old nest of Raven and pair present until end August but no eggs hatched
- 1959 Site deserted
- 1960 As 1959 although odd birds seen in June and two kills (both Feral Pigeon) found

Eyrie 5

This site is on a lonely stretch of cliff, extremely difficult to see and the least likely to be disturbed. There used to be an R.A.F. bombing range near-by and for this reason there are no detailed records until 1955 when there was a pair present but no breeding. The same thing happened in each of the next four years and so the position remained unchanged from 1955 to 1959. In 1960, however, there appeared to be a new falcon (her predecessor had been a strikingly pink-breasted bird) and breeding took place; one young falcon and one young tiercel flew early in June.

Eyrie 6

This is a very old eyrie that was in use both before and after the war, but in 1957 the birds failed to breed successfully and they have not done so since. Odd birds were seen in the area in 1958 and 1959, but not in 1960.

Eyrie 7

The usual site is on an island a mere thirty yards from the mainland. The pair was present in 1958, but not in 1959 or 1960.

Eyrie 8

This is probably the best known eyrie in Cornwall and it has been in use for at least seventy years. There are three alternative sites and all had been successful before the war. After the war, young were produced regularly up to 1956. In 1957 and 1958 the pair was present, but did not breed. In 1959 and 1960 no birds were seen.

FACTORS WHICH MAY BE RESPONSIBLE FOR THE DECLINE

(a) Excess of females and surplus of non-breeders

This appears to be the most important factor of all, but it requires much further study before definite conclusions can be reached. It is the only factor which affects the breeding biology as a whole and it seems to follow a quite definite pattern.

The crux of the matter is the appearance of a second adult falcon at the eyrie while the owning female is sitting. I have twice witnessed this as a prelude to desertion. I have also twice seen immature falcons around the eyrie in April during the incubation period. Does the tiercel abandon his mate when the second female arrives, causing

her to desert her eggs and go off in search of food? This would seem quite feasible, but it is difficult to distinguish between adult falcons unless one has very distinct markings. The suggestion is that, since the end of the war, we may have been left with an unstable Peregrine population with a disproportionate number of falcons to tiercels. But if this is so, why the breeding successes of the period 1950-1955?

(b) *Human interference*

It is impossible to assess the damage done by egg collectors and pigeon fanciers, as it is obvious that the long established eyries are the best known and therefore the most likely to be robbed or "disturbed". There has also been a great increase in the number of hikers and campers who invade the cliffs during the summer, but fortunately the young Peregrines are usually on the wing by 10th June.

Casual interference is of little importance at well established eyries on high cliffs, but in the case of "inexperienced" pairs, particularly ones nesting on low cliffs, undue disturbance may well cause desertion. It does seem probable that Peregrines are much more open to disturbance nowadays than in the pre-war years when their favourite haunts were seldom invaded by humans.

(c) *Predation of eggs and young*

It is very noticeable along the coast that, since myxomatosis, there has been a great increase in the undergrowth. Where once there were almost bare cliff faces, there is now a mass of grass and bramble. Consequently, I have had four separate encounters with Foxes (*Vulpes vulpes*) in broad daylight in the vicinity of eyries. Near one eyrie the remains of fourteen Herring Gulls (*Larus argentus*) were found, all clearly the work of a Fox. Near another eyrie all four young Ravens (*Corvus corax*) had been dragged from their nest and carried inland for about a hundred yards. At yet another eyrie, early in June, three eyass Peregrines were observed sitting out on the scree underneath the nest site and the following day only one was left; I was able to visit this site daily and I am convinced that the other eyasses were taken by a Fox.

(d) *Changes in food supply*

I do not believe this factor to be of any significance because there does not appear to be any serious drop in the amount of available food. In fine weather there is always a plentiful supply of Feral Pigeons (*Columba livia*)* passing up and down the coast. A tiercel hunting

*I make no distinction between Feral and Homing Pigeons because the rings on the legs of the latter are the only accurate way of separating them and this is impossible in the field.

for food is seldom away from the eyrie for more than an hour to an hour and a half. It is only in wet weather, when there are fewer pigeons, that he may have any difficulty. Even then, Jackdaws (*Corvus monedula*) are very common as cliff breeders in this part of Cornwall and Puffins (*Fratercula arctica*) are present in quite large numbers in some places.

It is interesting to note that Whimbrel (*Numenius phaeopus*) on migration in May are very often pursued with great relish by both falcons and tiercels. They seem to be regarded as particularly attractive food.

PREY AND FEEDING HABITS

The food remains examined at eyries in the Newquay-Hartland area are summarized in Table 2. It will be seen that Feral Pigeons are by far the largest item. In fact, originally I did not always make a note of pigeon kills as they were so frequent. During the spring and summer large numbers of Feral Pigeons are to be found along the Cornish coast. Some are on passage, but many are semi-resident or resident and it is these birds which form the main part of the Peregrine's diet.

TABLE 2—FOOD REMAINS AT PEREGRINE (*Falco peregrinus*) EYRIES IN CORNWALL, 1958-60

Feral Pigeons (<i>Columba livia</i>)	31+	Kittiwake (<i>Rissa tridactyla</i>)	1
Whimbrel (<i>Numenius phaeopus</i>)	3	Blackbird (<i>Turdus merula</i>)	1
Puffin (<i>Fratercula arctica</i>)	3	Partridge (<i>Perdix perdix</i>)	1
Tern (<i>Sterna</i> sp.)	1	Jackdaw (<i>Corvus monedula</i>)	1

I am grateful to Mr. Khan for pointing out to me that Peregrines appear to favour lightly coloured pigeons. During 1960 I noticed that the majority of victims were whitish birds, often with pale fawn markings. It could be that light birds are much easier to keep in focus over the sea.

Hunting flights

In my notes I have recorded twenty-eight hunting flights, and ten of these were successful. In three cases I was able to witness the Peregrine "binding" to a pigeon in the air. In the other seven instances, after I had watched part of the flight, the Peregrine was either seen feeding on the kill on the ground or carrying it back to the eyrie. The hunting flight of a Peregrine at a pigeon can be quite a lengthy affair and the kill may occur some distance from the start.

The percentage of kills to flights is much higher than that given by Rudebeck (1950-51), because I have made a clear distinction between true hunting flights for the purpose of securing food and "playful" stooping at Buzzards, Ravens and other birds.

SUMMARY AND CONCLUSIONS

(1) After the 1939-45 war, during which period its numbers were much reduced and breeding prevented by the official campaign of destruction, the Peregrine (*Falco peregrinus*) quickly recovered in Cornwall until by 1955 there were almost as many pairs as in the 1930s. Since then, however, there has been a sharp decline in the effective breeding of this species in Cornwall.

(2) The reason for this is still obscure, but there is an excess of females in the population and this seems to be a factor of some significance, which certainly requires further investigation. Other factors, such as human interference, predation and the availability of food are discussed in the text.

(3) Feral Pigeons (*Columba livia*) were easily the main food species found at eyries in the breeding season. These formed over three-quarters of the remains examined at sites between Newquay and Hartland.

ACKNOWLEDGEMENTS

I should like to thank Mr. R. Khan for his valuable help and co-operation, and Col. W. E. Almond for his advice in the preparation of this paper.

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Lanceolated Warblers at Fair Isle and the problem of identification

By Peter Davis

ON THE AFTERNOON of 30th September 1960 Pierre Devillers, a very competent young Belgian ornithologist, found a small drab-brown warbler in the renowned "warbler-ditch" at Lower Leogh, Fair Isle. It was an extraordinarily skulking bird, evidently a *Locustella*, and though he had to wade among the vegetation in the ditch, and almost tread upon the bird before it would fly, he failed to get any adequate view of the plumage; he could only describe it as a smaller, drabber version of the Grasshopper Warbler (*L. naevia*), and certainly outside his previous wide experience of the European marsh-loving species. He eventually lost the warbler in the edge of a turnip-rig adjacent to the Meadow Burn, and a later intensive search of this area drew blank. From his account, I strongly suspected he had seen a Lanceolated Warbler (*L. lanceolata*), for the appearance and behaviour

seemed very reminiscent of the example I had previously encountered on 21st September 1957 (*Brit. Birds*, 51: 243-244).

It was not until mid-afternoon on 4th October that we rediscovered what was presumably the same bird, in an extensive tract of reed-grass (*Phalaris arundinacea*) at Shirva, close to a higher reach of the Meadow Burn, and some 400 yards north of Lower Leogh. Devillers had just flushed what proved to be a late Sedge Warbler (*Acrocephalus schoenobaenus*) from this site, and called to Brian Milne, Gordon Barnes and myself to join him. We had hardly waded into the three-foot high reed-grass when both the Sedge and a smaller, darker "fan-tail" flitted before us, immediately diving back into the cover. There followed a quite frustrating half-hour during which we never had more than a fleeting glimpse of this warbler. Often it sat tight, even though our line of beaters was spaced at no more than a couple of yards apart. Eventually we brought two sixty-foot mist-nets, trampled a clear corridor through the apex of the patch, and set the nets so that they completely spanned it. Knowing that Grasshopper Warblers will often pass through the mesh, we had little hope of taking the smaller bird. The Sedge was soon caught, but the *Locustella* passed through the net on at least three or four occasions, without pausing in its flight. Happily on the next passage it snagged a carpal joint just long enough for me to get a hand to it, and a glance at the gorget of closely-spaced streaks on the breast confirmed its identification as a Lanceolated.

The captures were quickly taken the two miles to the Observatory by car, and within a few minutes the laboratory procedure was carried out. Afterwards the Lanceolated was released, in failing light, at the Gilsetter marsh. It was not identified again, though as late as 21st October James A. Stout briefly saw a small, dark warbler "of the Lanceolated line" in a roadside drain at Eas Brecks, and he reported that he had glimpsed a similar bird near-by in Homisdale three days earlier. Both places are within half a mile of Gilsetter. We looked for this bird later on the 21st, without reward.

The laboratory record of our capture, which was compared with skins of both Grasshopper and Lanceolated, was as follows:

Entire upper-parts very similar to Grasshopper, but rather drabber, with broader dark centres on mantle and rump. Narrow dark centres on crown gave head a distinctly streaked appearance. Narrow buff supercilium barely extending behind eye. Chin whitish bordered by narrow dark streaks. Breast and belly whitish, with gorget of narrow dark striations on upper breast. Slight buffish wash in this area, and darker brownish wash on flanks (also striated but more sparsely) and under tail-coverts (not streaked). The wings and tail were little worn, and the bird was presumably in its first winter. Upper mandible dark horn, lower pale pinkish with dark tip. Legs clear pink. Iris dark olive-brown. Measurements: wing 52 mm., bill 13, tarsus 18, tail

(centre) 45 and (outer) 30. Wing-formula: 1st primary 2.5 mm. longer than coverts, 3rd longest and emarginated, 2nd -0.5, 4th -2, 5th -3.5, 6th -5 7th -6.5. The weight was 11.4 gm. at 1625 GMT.

It should be noted that the weight was almost 4 gm. heavier than that of the 1957 capture (7.6 gm.), but within the range of three weights of Chinese examples quoted by K. Williamson in his *Identification for Ringers No. 1* (1960). This seems to support our view that the bird of 30th September was the same as the trapped one, for by 4th October it would have made good the losses entailed by its flight to the island.

My next encounter with a Lanceolated came much sooner than anticipated. At mid-morning on 1st November 1960, a grey showery day with a gale of force 8 or 9, I was walking along the road at Taft when another small dark "fan-tail" showed itself briefly among the flattened, tangled grasses of the verge. I had great difficulty in putting it to flight, though I could often follow its progress by an undulating movement in the horizontal dead grass—a movement more like that caused by a small mammal than by a bird. This behaviour was almost enough to convince me I had another Lanceolated, but, as some sort of description was imperative, I continued the chase for twenty minutes or so. There was a considerable delay whilst I extricated the quarry from a dry-stone dyke, and then it took to the tussocks in a neighbouring meadow, seldom moving until I explored its refuge with the toe of my boot. As with the October bird, I never had an unimpeded view while it was at rest, until during one of its short flights it was caught by the gale and dashed against a wire fence. It fell to the short turf below and very briefly sat facing me, its bill gaping; and I clearly saw the streaked gorget, indistinct supercilium and pale pink legs (on which there was no ring) from less than five yards' range. It then recovered and flew some distance downwind. I left it there, but Gordon Barnes and I subsequently explored the district without result. We later learned that James A. Stout and James Wilson had also pursued the bird in the same place an hour or two before I came across it, and had likewise concluded it was a Lanceolated. They had lost it in the meadow and had been quite unable to flush it, although certain it had entered a particular tuft surrounded by open ground.

Our experience of these 1960 birds indicates that part of the behaviour of the 1957 one, which explored the stubbles around our feet, in full view, was probably exceptional; no doubt because it was freshly-arrived and tired. At no time in the field did we see clearly the dark striations on the upper-parts of the recent specimens; the impression was simply of a rather uniformly-coloured bird, somewhat darker and greyer than a Grasshopper, and with "rather less tail" in proportion to the size. Future observers familiar with the Grasshopper Warbler should be reasonably sure of the Lanceolated from its

minute size (no other *Locustella* is so small) and drab dark coloration, and from its even greater tendency to skulk closely and to find cover where there seems to be none. With perseverance they might be fortunate enough to glimpse the characteristic pattern of the breast.

Following the list in P. A. D. Hollom's *The Popular Handbook of Rarer British Birds* (1960), these are the eighth and ninth documented occurrences of this north-east European and Asiatic species at Fair Isle, and the tenth and eleventh in Britain.

The moult gatherings and moult migrations of Shelduck in north-west Germany

By Friedrich Goethe

Vogelwarte Helgoland, Headquarters Wilhelmshaven

A PREVIOUS PAPER (Goethe 1961) gave the results of an aerial survey of moulting Shelduck (*Tadorna tadorna*) on Knechtsand, Germany, and the conclusions of the International Commission which enquired into the destruction of these birds by bombing in the autumns of 1955 and 1956. The account which follows here sets out the records of the Vogelwarte Helgoland on the moult migrations of the Shelduck in the Heligoland Bight. The more significant localities mentioned are shown in Fig. 1.

OTHER MOULTING PLACES

Goethe (1939) reported that several small contingents of flightless Shelduck were observed off the eastern sand flats of the island of Mellum in the middle of September that year. Between 15th July and 10th August 1952, about 15 flightless adult birds were seen on the eastern sand flats of Spiekeroog. Both occurrences were probably cases of "perplexed moult" by birds which had not reached the usual moulting place in time and therefore started to moult just near it. Possibly this occurs more frequently on Mellum, as all the conditions are very favourable and the island lies not far from Knechtsand. Nevertheless Shelduck do not moult on Mellum every year, as observations in 1954 proved.

Although the sandflats round Scharhörn are nearest to the chief moulting centre and are separated from it only by the Till Channel, reports from the observatory's substation there show that they cannot be regarded as a moulting place which is regularly visited to any extent. Completely flightless birds are found there chiefly towards the end of the moulting season, often decidedly late. Such birds, as was

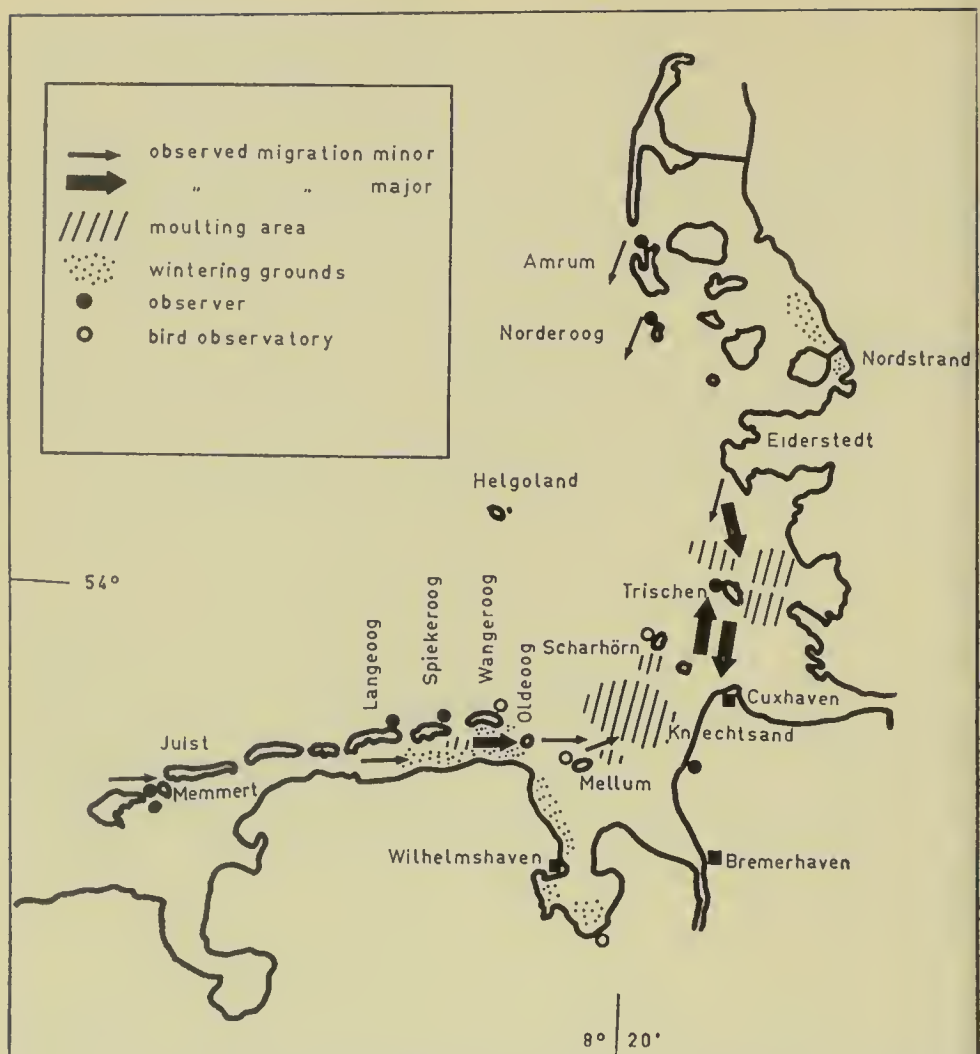


FIG. 1. Map of the Heligoland Bight, showing the moulting areas, migration routes and wintering grounds of the Shelduck (*Tadorna tadorna*), together with the positions of the observers and observatories on whose records these data are based. In addition to the moul migration marked, movements after the moulting season were reported at Spiekeroog (minor, westwards) and Trischen (larger, north-north-east)

noted by Henneberg (1951) in 1950 and by H. Rennau and H. Schwartzhoff in 1956, are usually sick or wounded. Probably the Shelduck do not feel safe on the Scharhörner-Neuwerk flats on account of their easy access from the island of Neuwerk at low tide. However, it is evident that moulting Shelduck are carried on to the Scharhörner flats from time to time, perhaps through drifting in westerly gales (see page 150), and a useful gauge to numbers is provided by the fact that they use them as an intermediate resting place before and especially after the moul, often from the end of August.

Peters (1887) reported large masses of Shelduck at the mouth of the Eider on 27th July 1885, but it is not known whether this observation referred to a moulting place or merely a resting area. Weigold (1914) and Leege (1916) wrote in detail about the moulting area around Trischen. Important information regarding it was given by a seal hunter, Hermann Schiffer, from Juist. Since 1869 this man had often visited Trischen and observed many thousands of Shelduck in August, which in his opinion assembled there from all the islands of the North Sea to moult. Leege reported that "in endless flocks the flightless, helpless birds sat on the high water line and at low tide they began to retreat anxiously, walking quickly to seek refuge on the island where, however, large numbers were clubbed to death. The skin and feathers were stripped off the breast and belly, spread on a board to dry, then treated with alum and sold in Nordeney or Bremerhaven at a mark apiece to furriers, who made them up into muffs by joining four skins together. The flesh was briskly roasted or boiled and, according to Schiffer, was a delicacy which, however, could not be kept more than a few days as the taste then became too oily." And Weigold, who in mid-July 1913 found thousands of moulting Shelduck on Trischen, also refers to these "slaughterers"—"such butchery of flightless birds is not worthy of the word 'hunting'"—who went out chiefly from Büsum.

As a 58-year old fisherman from Dorumerstrich, Ernst Huck, told the observatory, this prolonged persecution* and disturbance must have led to the transference of the focal point of the Shelduck concentration more towards Knechtsand. Recent observations round Trischen support the correctness of this supposition. This man's 92-year old father, Wilhelm Huck, also a fisherman, reported verbally to the observatory in September 1955 that shortly before 1914 enormous masses of the "bright duck", such as had never before occurred, suddenly appeared on Knechtsand. Boie Severin, a 65-year old fisherman from Büsum, gave the observatory verbal and written information that he had known the flats around Trischen, Scharhörn, Grosser Knechtsand and Mellum as moulting places of Shelduck since 1911 and that these were areas about which the "old people" had always spoken; of them, Grosser Knechtsand was the most important. Without doubt, the Trischen area (including the Tertiussand) is the second largest moulting place today. Unlike Knechtsand, this assembly is subject to great fluctuations—doubtless as a result of the disturbance caused by people living on the coast searching for wood, as they still do to a considerable extent.

*Since 3rd July 1934 the Shelduck has been fully protected under the German hunting law.

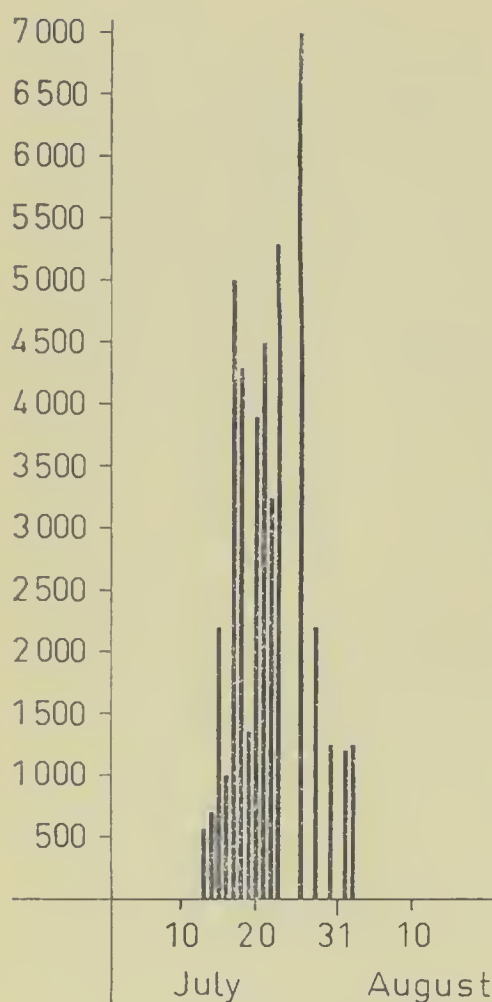


FIG. 2 (1950)

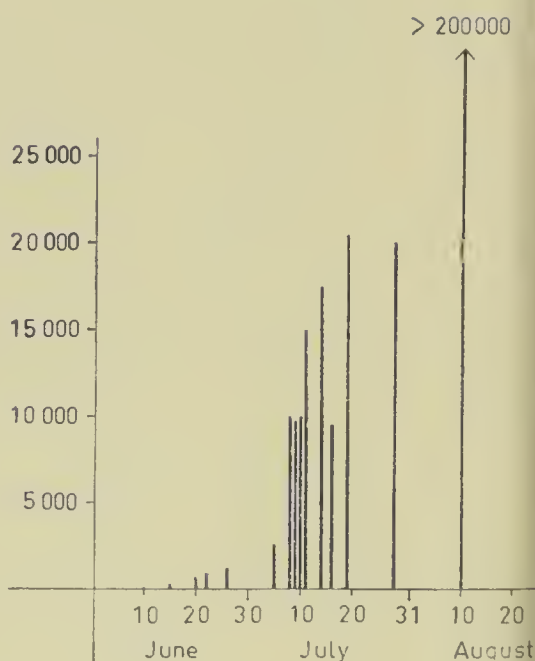


FIG. 3 (1952)

Numbers of resting and moulting Shelduck (*Tadorna tadorna*) off Trischen, Germany, in 1950 and 1952

NOTE: The vertical scale varies in these and other figures in this paper

Outstanding records of observations were received by the Vogelwarte Helgoland from the Bund für Vogelschutz (Headquarters Stuttgart). These had been collected by Hugo Wolter, for many years the warden of the seabird reserve on Trischen. His data for 1950 (Fig. 2) relate principally to the passage migration of Shelduck and are discussed later (see page 152). As the number of moulting birds recorded on Trischen in that year was less than in 1952, it is remarkable that many were observed on the flats of the Bielshöven Sand and Marner Plate at the end of July and the beginning of August 1950; the seal hunters reported that on 31st July several thousand

Shelduck were either contentedly drifting with the tide towards land (Goethe 1961, p. 112) or had walked on to the higher sand. However, according to Wolter's records for 1952, when he noted arrivals from the middle of June (!) and saw moulting specimens from 8th July, far more Shelduck remained to moult on Trischen then (Fig. 3). During the first ten days of August several hundred thousand birds were observed, of which about 90% were flightless. By the middle of August several freshly moulted Shelduck could already fly again. At this time Wolter obtained colour film documentation which is in the possession of the Bund für Vogelschutz. The enormous difference between 1950 and 1952 is striking.

There is further important information for 1953 and 1955, which also illustrates these fluctuations. In 1953, according to N. Drews (*in litt.*), no Shelduck stayed on the coast of Meldorf, but in 1955, according to the statements of the crew of the lifeboat *Hindenburg*, large numbers were assembled in the Trischen area (compare the findings of the International Commission, in Goethe 1961). Also, Wendehorst (1938) refers only to many hundred moulting Shelduck on Trischen. There is, therefore, no doubt that Trischen is not regularly visited by the same quantity of these birds. Finally, D. König (*in litt.*) states that in this area in 1948 he saw flightless Shelduck, which were otherwise apparently quite healthy, as late in the season as 11th October.

To summarise, it can be stated that according to existing information the Grosser Knechtsand complex (including Kleiner Knechtsand, Tegeler Plate, Osteversand and the Till sands) is the most regularly visited and largest moulting centre of the Heligoland Bight and therefore probably of the whole of Europe. The second largest is the Trischen complex (Tertiussand, Bielshöven Sand and Marner Plate). Scharhörn and Mellum are only occasionally used as moulting places by small numbers of birds, as are all the other places further west, and possibly north, of this centre.

The factors governing the choice of just these few particular areas of tidal flats are still not precisely known. However, in view of what is understood of the vital needs of Shelduck during the moulting season, the following are probably primary requirements: (1) peace and protection from Foxes (*Vulpes vulpes*) and humans*; (2) extensive flats of sand or mud which are covered at high water and which at low water become almost dry and provide a sufficient nucleus of mollusc food; (3) banks of higher sand which at normal high water remain uncovered and serve as a refuge for resting and feeding, and which also afford

*Both the Heinroths (1928) and also K. Lorenz (*in litt.*) have stated that Shelduck which had been bred in captivity suddenly became more timid before the onset of the moult.

the birds some protection from being swept away at times of floods and gales; (4) large systems of sand flats in which there are adequate zones of calm water even when the sea is rough. How vitally important sands above high water mark are for moulting Shelduck is shown by the events on Trischen in the summer of 1950, when in a strong westerly gale at high tide thousands were saved only by the sand banks. In the same summer on Scharhörn the birds similarly collected in the lee of the island close by the upper tide line whenever there was a westerly gale (Henneberg 1951).

The densest concentrations of Shelduck use the highest dry sand only for resting and when in search of food they go to suitable areas rich in marine life. In the Knechtsand area they were found quite consistently on muddy flats, by dykes and water channels with muddy edges, and on beds of eel grass (*Zostera*) and Mussels (*Mytilus edulis*). The fresh stomach contents of two specimens examined on Mellum in the first half of September contained remains of *Hydrobia*, Mussel grits and sand. The stomach contents of ten Shelduck collected by K. Greve on the Neuwerk flats in October 1958 were analysed by Dr. W. Schäfer of the Senckenburg Institute at Wilhelmshaven. Beside soft and rough grains of sand, and mud and algae chlorophyll, he chiefly found remains of *Hydrobia*, of juveniles of the clam *Mya arenaria*, of another mollusc *Macoma baltica*, of undetermined snails and of shells of Foraminifera. Only one small fragment of chitin was noted.

MIGRATION AND RESTING PLACES

The following information relates to the results of a questionnaire on the moult migration of the Shelduck on the German coast, which since 1950 has been organised by the Vogelwarte Helgoland within the framework of the censuses of the International Wildfowl Research Bureau.

Direct migratory movements of Shelduck were recorded in only a few places (Fig. 1). This was no doubt due to the fact that Shelduck mostly move at night, which conforms with the observations made by Coombes (1950) on their departures. Therefore, migrating Shelduck were chiefly observed on the German coast in the early morning between 0400 and 0800, sometimes also later, but seldom during the whole day. Occasionally there was migration to be seen in the evening.

On the East Frisian and Oldenburg coasts easterly migration took place from the middle of June and July until the beginning of August. The flocks averaged 22 birds, with a maximum of 72. They mostly flew low, between two and 20 metres (six to 65 feet) over the shallows, though occasionally up to a height of 100 metres (about 325

MOULT MIGRATIONS OF SHELDUCK IN GERMANY

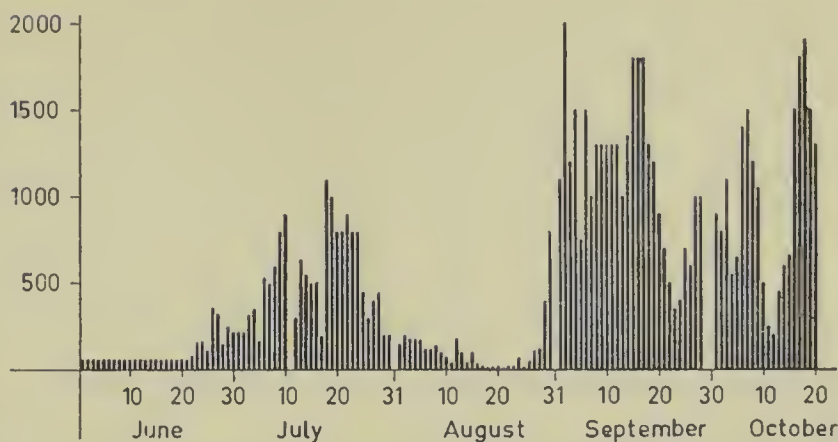


FIG. 4. Numbers of resting (not moulting) Shelduck (*Tadorna tadorna*) off Mellum, Germany, in 1955

feet). Long rests before the moult did not seem to take place on Spiekeroog and the occurrence of resting birds was actually first noted there on the return migration after the moult. At Oldeooog arrival migration could be noted from the second half of June and direct migration eastwards from about 25th-30th July. The situation with regard to Shelduck resting on the island of Mellum was described by Goethe (1939) with special reference to 1931. In connection with the results of the investigations carried out by the International Commission, however, the observations of 1955 (Fig. 4) are of even greater interest. These show a steady build-up until 10th July, followed by more spasmodic arrivals in the next three weeks, an almost total disappearance of the birds about 15th August and a further fluctuating return movement from the beginning of September. Whether the first contingents consist principally of males, as Maebe and van der Vloet (1952) assumed, has not yet been confirmed. In 1954 a flock of 200 strange Shelduck appeared on Mellum during the first few days of July and the return movement began at the end of August (Fig. 5). The sequence of events was similar in 1956, except that the arrival migration began in the second half of June, as it did in 1952. On the Jade flats north of Wilhelmshaven and on the "Entensee" the increase also began during the last part of June and continued until 4th July. It was not the same in 1955, however, because on the way the birds visited the inner Jade Bay where Shelduck occur only after the moult (Fig. 6). From Mellum migration has been observed passing the Hoheweg lighthouse to Knechtsand. On Scharhör arrival migration clearly began on 13th July in 1955, but as early as 21st June in 1952. In 1955 departure of birds that had completed their moult started on September 20th and continued in a north-east direction. In 1957 the

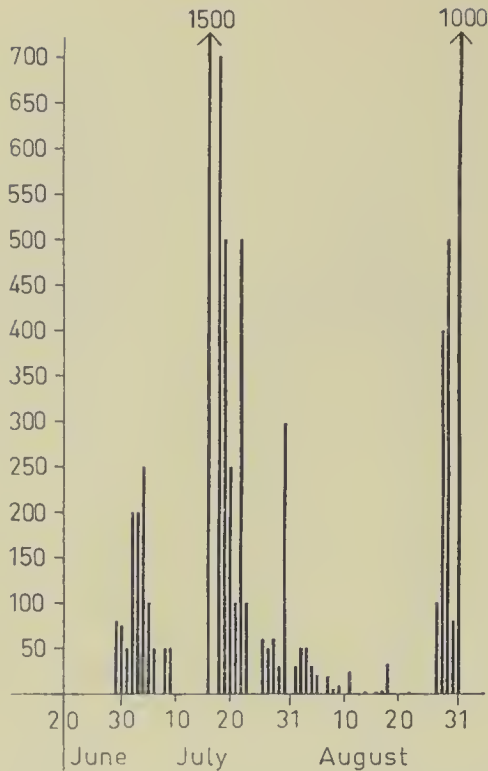


FIG. 5. Numbers of resting (not moulting) Shelduck (*Tadorna tadorna*) off Mellum, Germany, in 1954

bird warden on Scharhörn, P. Meesenburg, made the following counts of the Shelduck there:

<u>30.vi</u>	<u>15.vii</u>	<u>25.vii</u>	<u>23.viii</u>	<u>31.viii</u>	<u>6.ix</u>	<u>24.ix</u>	<u>12.x</u>
400	1,500	2,000	4,000	18,000	20,000	10,000	5,000

These included hardly any flightless birds. Throughout this time most were moving quickly on, to or from Trischen, and were obviously just resting before or after the moult.

H. Wolter's observations on Trischen in 1950 and 1952 are again of interest in connection with those just discussed. There a brisk migration, largely in flocks of 15-22 birds, took place from the north, mostly from about Blauortsand to the south-west (in the direction of Cuxhaven). South-westerly migration was also observed early in the morning on 1st July 1952 off the north point of Amrum, on the sea side of the island, and on 7th August 1953 off Noorderoog. The height of flight over Trischen was between two and 35 metres (from six to about 115 feet). Stronger winds tended to cause a reduction in the amount of migration, though this was not always the case. While



PLATE 23. Red-necked Phalarope (*Phalaropus lobatus*) guarding his young, and brooding them in the hand, Norway, July 1951 (page 135) (photos: Edvard K. Barth)





PLATES 24 and 25. Wood Sandpiper (*Tringa glareola*) carrying off hatched eggshell (*above*) and brooding chick and eggs on observer's hand (*below and right*), Norway, June 1951. This species is seldom as tame as the Red-necked Phalarope and Dotterel, and this was an exceptionally bold bird. It allowed five people





near its nest and walked among them. As each egg hatched, it flew off with the empty shell and returned at once. When the photographer's wife put her hand in the nest depression under the eggs and young, the bird pecked it a few times at first, but soon settled down to brood them (page 136) (*photos: Edvard K. Barth*)





PLATE 26A. Left, Dotter (*Charadrius morinellus*) allowing itself to be stroked as it fluffs up its feathers over new-hatched young, Norway, July 1951. This is traditionally the tamest wader of all, but individuals vary and the closer the eggs are to hatching the more reluctant the bird is to leave, particularly if it is cold or raining (page 135) (photo: Edvard K. Barth)

PLATE 26B and 26C. Right, another male incubating hard-set eggs while an observer's face is actually touching the side of its head, Norway, June 1946. Below, the male in a above brooding its young in the hand and even allowing itself to be lifted off the ground while doing so (page 134) (photos: Edvard K. Barth)



MOULT MIGRATIONS OF SHELDUCK IN GERMANY

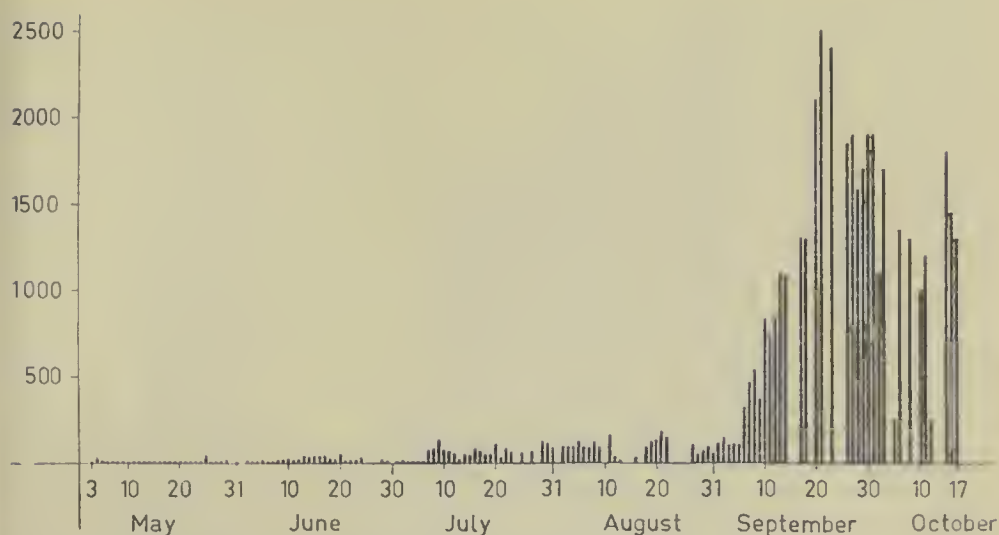


FIG. 6. Numbers of resting (not moulting) Shelduck (*Tadorna tadorna*) at the south end of Jade Bay (south and south-east of Wilhelmshaven), Germany, in 1955

many Shelduck migrated straight past Trischen, single flocks came down on the flats around the island and they did so in a most characteristic manner, rising first to a height of about 20 metres and then plunging down. Further migration to the south-west took place when the Shelduck were startled by fisherman or other people on the flats. In the summer of 1952 (Fig. 3) the first migrants to arrive on Trischen came much earlier than in 1950, namely in late June. Variation in the time of moult migration was recently reported by Lind (1957) in Jutland.

Wolter also made the surprising statement that after a few days, about 19th July, flocks of Shelduck also came *from* the south-west, about the direction of Cuxhaven, and settled on the flats around Trischen, then returned to the south-west at high tide. These observations agree well with those on Scharhörn, where it was noted in 1955 that there was active movement of Shelduck between the Scharhörn and Trischen flats with the rise and fall of the tide. At the end of July Shelducks came only from the south. One gains the impression from Wolter's reports that two distinct groups of Shelduck on moult migration join at Trischen, namely those from the west North Sea (British Isles) and those from Jutland (Scandinavia). Without many more ringing recoveries, however, we cannot say whether the moulting centre at Trischen is used more by one group than the other. As the striking fluctuations from year to year already show, the visits to Trischen are unstable even before the beginning of the moult.

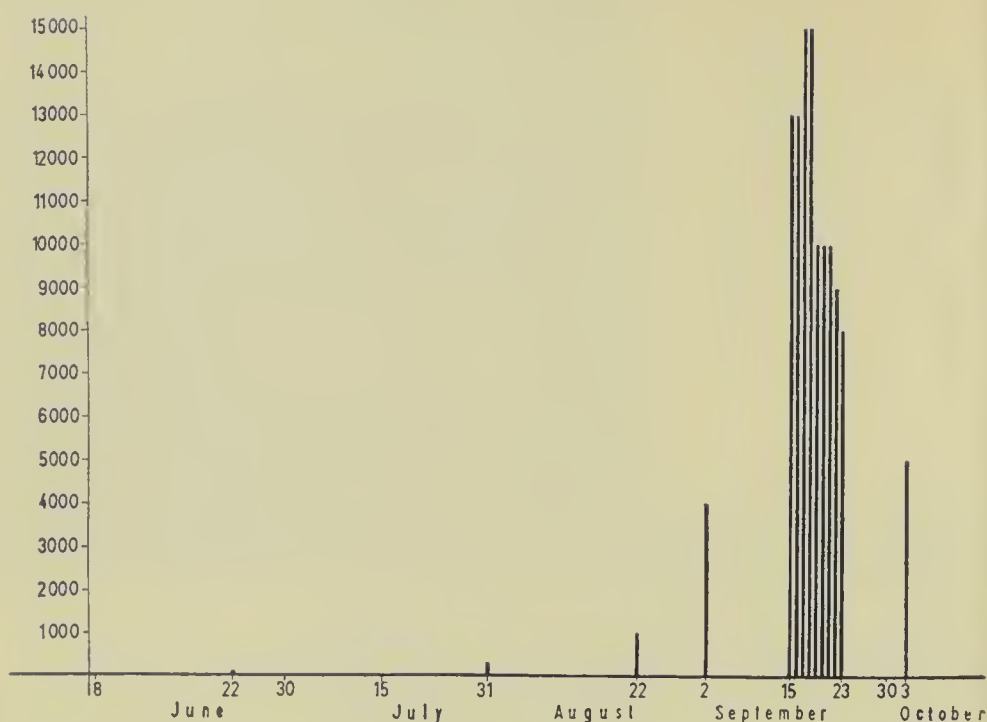


FIG. 7. Numbers of moulting Shelduck (*Tadorna tadorna*) off Scharhörn, Germany, in 1955

At Nordstrand D. König (*in litt.*) reported that in 1953 the arrival of adult Shelduck began in the first three weeks of July and evidently further arrivals followed, first of old birds and later chiefly of young ones. In the autumn of 1959 König noted that, of 3,000 Shelduck, 75% were young birds moulting into their first adult plumage.

Mention must also be made of some observations by Harrison (1952). At the beginning of July 1950 he recorded 200 Shelduck coming from the east over the Pagensand (Lower Elbe) and he thought that these might be Baltic birds. According to Beckmann (1950), the adults disappear from their breeding areas in the Baltic in July and head towards the North Sea flats without the young birds. In the Wismar Bight, east of Lübeck and in the very south-west corner of the Baltic sea, H. Thorbeck (*in litt.*) recorded departures (but no arrivals) of adult birds in July, while the young remained.* According to a theory put forward by G. Schmidt (*in litt.*), the westerly migration of these Baltic birds is similar to that of the Common Scoter (*Melanitta nigra*) and the Eider (*Somateria mollissima*) and follows approximately a course from Lübeck Bay, through the sound between Fehmarn and the mainland, round Heiligenhafen and Eckernförde, and thence

*According to Hoogerheide and Kraak (1942), young birds evidently have a distinct autumn migration.

MOULT MIGRATIONS OF SHELDUCK IN GERMANY

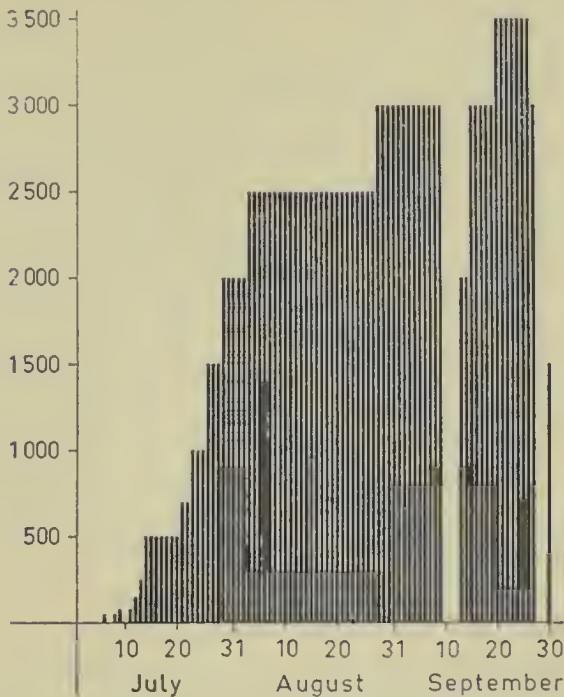


FIG. 8. Numbers of moulting Shelduck (*Tadorna tadorna*) off Scharhörn, Germany, in 1957

across Schlei and Schleswig to the North Sea. The active south-westerly migration which A. Ibs (*in litt.*) observed from 29th August to 22nd September 1953 on the Eiderstedt peninsula may have consisted of young birds leaving late, or possibly of adults which had moulted unnoticed in the shallows of Die Halligen or further north.

The beginning and peak of the moult differ from year to year and are probably dependent on the progress of breeding, which, in turn, is greatly influenced by the general summer weather. It is not at all exceptional for some female Shelduck still to be nesting on the East Frisian Islands at the end of July. It has been stated that in such late cases the old birds depart on their moult migration before the young are fully fledged, but according to the detailed observations of Lind (1957) this is not so. Lind gives numerous data on the moult and autumn migrations of Shelduck in the Danish sea-bird reserve of Tipperne (West Jutland) and these are of great importance to our discussion. The flocks start assembling at Tipperne as early as June (sometimes even May) but more particularly in July, and at the beginning of August they begin to disappear south to the moulting grounds. Over a period of twenty-seven years Lind collected some remarkable facts about the varying proportions of different age groups and sexes participating as the season progresses. From 1929 there was an increase in the number of resting flocks reported in Jutland and it was

thought that this might be connected with the increase in the Danish breeding stock which, in turn, might be a result of the total protection introduced in 1927. Lind surmised that the migration route of the Shelduck resting at Tipperne is diagonally across Jutland from the east and then along the west coast to the south. He interpreted the arrival migration of recently moulted Shelduck after 6th September as the return of birds from the moulting area in the Heligoland Bight, an assumption which it is hoped will soon be confirmed by ringing recoveries.

The departure migration, of Shelduck which have finished moulting, takes place conspicuously in the middle of September from Knechtsand and the neighbouring places. Sometimes they start to go at the beginning of the month and very occasionally, as in 1950, at the end of August. The records of the adjacent observation stations show this clearly (Figs. 4, 5, 7 and 8). Westerly migration is also seen on the East Frisian chain (Fig. 1) and north-easterly migration on Scharhörn.

WINTERING

Requate (1954) quotes the German wildfowl counts as showing that the number of Shelduck in winter is relatively small, the maxima being noted during October and November and the minima in late December and early January. Nevertheless, numerous observations made through the Vogelwarte Helgoland show that the Shelduck is not at all rare in mild winters on the islands of Wangeroog and Mellum, on the coast of Jade Bay and in East Frisia. Also, Harrison (1952) saw large winter flocks at the mouth of the Elbe, while D. König (*in litt.*) reported a well frequented wintering ground in the shallows north and south of Nordstrand. There, for example, three thousand Shelduck were counted in the winter of 1949-50, three-quarters of them being immature birds! According to F. Steiniger (*in litt.*), Avocets (*Recurvirostra avosetta*) also stay there if the weather is mild. König states that the Shelduck is a most plentiful and regular winter resident so long as the weather permits and that, in his experience, this applies to the whole coast. Hansen and Palm (1951) report large numbers of Shelduck wintering in South Jutland in 1945-46 and, while Lind (1957) considers that, in general, wintering in West Jutland is unlikely, the total which stop on the west coast of Schleswig-Holstein is estimated by König and Steiniger to be 25,000.

How important a non-tidal feeding ground is for the wintering Shelduck is shown by the losses which were reported from Scharhörn in December 1949 (see also Hamm 1956), where, after prolonged gales, exceptionally large numbers of birds perished from exhaustion. Similarly, Henneberg (1951) reports that striking numbers of Shelduck died there in autumn 1950 for the same reason. There was a further

catastrophe between the end of November and mid-December 1952 on the coast of Schleswig-Holstein, according to König (*in litt.*) and Wolf (1952); there over a hundred recently dead and dying were found lying by the seawall in Cäcilienkoog. While Steiniger and others had assumed that this was also the result of starvation after gale floods, König was of the opinion that these birds were the victims of a virus disease, especially as in two specimens there was an unusual rotary movement of the head. The pathological tests, however, proved negative, so perhaps the destruction of these winter victims must be ascribed to starvation after prolonged flooding of the flats owing to gales. Unlike the Herring Gulls which have the same feeding areas (*cf.* Tinbergen 1952), they do not rapidly move away during such gales and, further, perhaps they cannot survive a shortage of food for so long.

Shelduck seldom occur on Heligoland itself (Goethe 1957) and so it is worth concluding this section by drawing attention to the observation recorded by Weigold (1912-13) at the end of January 1911.

RINGING RESULTS

Some recoveries of Knechtsand Shelduck in Britain have been published by Leach (1956-60). A survey by Goethe (1957) of the recoveries of the moulting population showed that from 1952 to 1956 B. Freemann and his associates ringed 793 Shelduck. Of these, 60 (7.57%) had been recovered, 13 of them locally (under 50 kilometres away) and 47 at greater distances, including 20 from Britain and Ireland, ten from the Netherlands, eight from France, five from Germany and two from Denmark. Between 1957 and 15th March 1961 a further 688 Shelduck were ringed by Freemann and his colleagues, and there were another 34 recoveries. These included 11 more from Britain and Ireland, three from the Netherlands and one each from Belgium and Norway, the remainder being from Germany. Fifteen of these were thus at distances of over 100 kilometres and they included the two most northerly ones of all. The first of these was ringed on Knechtsand on 31st August 1952 and found dead in Scotland—near Golspie, Sutherland (57° 58'N, 3° 58'W)—on 27th April 1958. The second, which had been ringed on 24th August 1952, was further north still; this was found long dead in Norway—on the Isle of Haram, Sunnmøre (62° 37'N, 6° 17'E)—on 11th March 1959.

To sum up, then, of 1,481 Shelduck ringed on Knechtsand since 1952, 94 (6.35%) have been recovered. Of these, 38 have been recovered in Germany, chiefly on the North Sea coast and mainly within 50-100 kilometres of the moulting centre. The remaining 56 give an indication of the areas of origin of the Shelduck which congregate to moult on Knechtsand. These have been from Britain and Ireland (31), the Netherlands (13), France (eight), Denmark

BRITISH BIRDS



FIG. 9. Recoveries of Shelduck (*Tadorna tadorna*) ringed on the Knechtsand moult grounds (area marked by large circle) since 1952. Numbers show months of recovery; those recovered in the year of ringing have a cross-ended line above the recovery dot and those in the following year a simple line. The data are as given by Goethe (1957) to the end of 1956, with the addition of fifteen further recoveries that were reported between then and 15th March 1961. There have also been nineteen more recoveries at distances of less than 100 kilometres, chiefly from the German North Sea coast; this total includes two birds found breeding in June on the islands of Langeness and Amrum (Schleswig-Holstein) after four and five years respectively. The most northerly recovery was of a bird ringed on Knechtsand on 24th August 1952 and found long dead on the Isle of Haram ($62^{\circ}37'N$, $6^{\circ}17'E$), Sunnmore, Norway, on 11th March 1959 (arrowed, just off top right corner). Finally, a few relevant records of birds ringed in Britain and Ireland (triangle), Netherlands (square) and Sweden (inverted triangle), and recovered on Knechtsand or Trischen, have been included. In addition to these, a Shelduck ringed as a juvenile at Korsör (West-Sjælland), Denmark, on 1st August 1954 was recovered dead on the mudflats by Neuwerk (i.e. near the moult centre) on 28th July 1955

(two) and Belgium and Norway (one each). In addition, Shelduck ringed in Britain, the Netherlands, Sweden and Denmark have been recovered in the Knechtsand area in the moult season.

The distribution and seasons of these recoveries are shown in Fig. 9

(from which, however, it should be noted that the nineteen recoveries since the beginning of 1957 at distances of less than 100 kilometres have been omitted). In addition, this map includes some recoveries in the Knechtsand area of Shelduck ringed on their breeding grounds. Without going into details of this work, it can be stated that the majority of recoveries of moulting Shelduck ringed on Knechtsand are, even during the breeding season, in Britain and Ireland. As is shown by the recovery on the Lancashire coast in December of the year of ringing, birds marked on Knechtsand at the beginning of September can reach northern Britain by the end of the year. This accords with the observations of Boase (1951) who observed a striking increase in the Shelduck population at the mouth of the Tay at the beginning of January. Our conclusions are also in complete agreement with those of Coombes (1950). Of fundamental interest is the intermediate moult migration of the British, Irish and Dutch populations against the more or less south-westerly departure of the Danish and other Scandinavian Shelduck in the Heligoland Bight, which those from the Baltic coast of Germany evidently also follow. In this connection, it is certainly not a coincidence that the direct observations of migration at Trischen at the beginning of the moulting season reveal two opposing directions of flight.

CONCLUSIONS

The present paper and the report on the aerial survey of Knechtsand (Goethe 1961) show that we already have a fair picture of the situation of the moulting areas in the Heligoland Bight, as well as of the size of the areas. Nevertheless, much remains to be done before we can fully understand the reasons for this imposing moult migration. The wide origins of the enormous numbers of Shelduck which assemble on Knechtsand are particularly interesting, especially when one bears in mind that in 1951, according to censuses made then, the German breeding population amounted to a mere 4,000. Compare this with the 100,000 which were probably present on Knechtsand at the end of July 1955 (Goethe 1961).

Many new facts could be obtained by careful field work over a long period on, for example, the dependence of the start and peak of the moult on the timing of the breeding season and the general summer weather. Detailed records of the numbers on Knechtsand are as much lacking as concrete evidence about the relative proportions of the sexes and of different age groups during the moulting season. Similarly, the feeding ecology of the moulting flocks, their average weights at different stages and their daily activity and behaviour in relation to weather and sea conditions require further investigation (the fluctuations between moulting centres of minor importance—as, for example,

Trischen—are perhaps connected with these). Above all, quantitative investigation remains of great significance. This last may be particularly important because, in view of the protection from shooting which the Shelduck at present enjoys in almost all European countries, the management of its numbers might one day again become necessary.

A most urgent task, in addition to the further ringing of moulting birds on Knechtsand, is an increase in marking and censuses of Shelduck in Britain and other countries of origin. This is because we still do not know enough about the arrival timings and proportional numbers of the various populations on this great moulting ground. As the shooting of this species is widely prohibited, the recovery rate is lower than that of many other ducks. It would be of great advantage, therefore, if by agreement every country could use an individual and durable colour mark for Shelducks, in addition to ringing them. The wider use of wing clips in marking unfledged young should also be encouraged.

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Notes

Unusual feeding behaviour of Marsh Harriers.—In late February 1959, at Minsmere, Suffolk, I watched a pair of Marsh Harriers (*Circus aeruginosus*) striding about in a rough grassy field and apparently searching for food. They appeared to be methodically looking only in the larger tufts of grass and were moving from tuft to tuft with a comical and cumbersome gait. The two birds were walking about independently and at some of the tufts one or the other would do no more than halt momentarily before striding to yet another tuft. At others, however, the bird concerned appeared to find something of interest to it and the behaviour was then always the same. It would bring its feet close together and literally spring a few inches off the ground to land right on the tuft. It would then immediately bend its head down towards its feet and quickly take something in its bill and swallow it. I could not see what it was they were feeding on, although I watched them for about three-quarters of an hour, but they were clearly eating something which could apparently best be found in the larger tufts of grass and the objects concerned must have been quite small.

BERNARD KING

A probable hybrid Great Black-backed Gull × Herring Gull in Devon.—At Appledore, North Devon, on 3rd October 1960, I noticed a gull alone on the water, about 50 yards from the quay, which

at first I took to be an adult Herring Gull (*Larus argentatus*) with an exceptionally dark back. This impression of tone was soon confirmed by direct comparison with several adult Herring Gulls (typical pale-backed *L. a. argentatus*) and an adult Common Gull (*L. canus*). Its mantle was much darker grey than in any of these, but never seemed quite dark (slate-grey) enough to suggest it might be an unusually pale British Lesser Black-backed Gull (*L. fuscus graellsii*), even before I could see its leg-colour. Later, I watched it for some time at ranges down to 15 yards, through binoculars and telescope, as it stood on the quay among a number of Herring Gulls. The light was good for judging tone and shades of colour (1300-1400 hours), sky overcast, no glare. The bird's legs were whitish flesh and its feet flesh-pink, and it also resembled adult Herring Gulls in the colour of other soft parts. It appeared to be in full adult winter plumage, with brown streaks on the head, except that its outer primaries were evidently not fully grown. Their tips reached only a little beyond the secondaries in the closed wing, and about half an inch short of the end of the tail; the two longest visible primaries seemed to have half an inch or more of white at the tips. Apart from its conspicuously darker mantle, this gull was distinctly taller than the Herring Gulls standing beside it, and seemed larger in all dimensions; the heavier build of its head and bill was especially noticeable. It appeared intermediate in size between an average Great Black-backed Gull (*L. marinus*) and a Herring Gull, though none of the former was close enough for direct comparison.

Its intermediate characters at once suggested that this was an adult hybrid *Larus marinus* × *argentatus*, and its behaviour that it was a wild bird thoroughly familiar with the locality. However, not knowing then of previous evidence of such hybridisation, I thought it seemed more probable that it was one of the darker and larger Siberian races of the Herring Gull. It was undoubtedly too dark and big for *L. a. omissus* (as defined in *The Handbook*), of which western examples have pinkish (not yellow) legs (= *argentatus* of E. Stresemann and B. Stegmann, who use *argenteus* for the race called *argentatus* in *The Handbook*, *vide* B. W. Tucker, *Brit. Birds*, 42: 170-172). However improbable geographically, it seemed nearest to the description of *heuglini* (= *taimyrensis*), which may have pink or yellow legs according to Tucker (*loc. cit.*). Incomplete examination of Herring Gull skins from Siberia in the British Museum collection did not support this idea, but was inconclusive: in limited time I was unable to find any which resembled the Appledore bird in mantle-colour and size and also had pinkish legs. A more thorough check on this point would probably entail considerable research and expert rearrangement of the B.M. material, which I examined by kind permission of Mr. J. D. Macdonald.

Subsequently, the balance of probability shifted strongly in favour of

the original interpretation that this was a hybrid *marinus* × *argentatus*, when I learnt of independent evidence, from two separate sources, of hybridisation between these species in the wild state. Far the most relevant was that a mixed pair of Great Black-backed and Herring Gulls had nested for at least five years (1952-1956) at Baggy Point, North Devon, only about six miles north of Appledore, and had successfully reared one or more young on at least one occasion (1956), though there had been no reports that the hybrid young had been recognised since fledging. I am most grateful to F. R. Smith for having drawn my attention to this significant evidence (recorded in the annual *Reports of the Devon Bird-watching and Preservation Society*, 1954-1956) and to Mrs. D. Wilson and D. R. Lysaght, the principal observers concerned, who have very kindly sent me their full notes on this pair. The Great Black-backed was presumed to be the male partner, though this does not seem to have been proved beyond doubt. In this connection, Miss A. P. Gray (*Bird Hybrids*, 1958) states that several such hybrids have been reared in confinement, with *L. marinus* as the male parent, and that the reciprocal cross has probably also occurred. The other evidence came from New Jersey, U.S.A., where an adult female gull obtained in January 1959 was almost certainly a hybrid of these two species (J. R. Jehl, *Auk*, 77: 343-345). Its legs were pale greyish white with a faint flesh tone and it seems to have been very similar in other characters to the Appledore gull.

K. B. ROOKE

Great Grey Shrike persistently chasing Dunnock.—On 5th February 1961 I was standing with several other observers, including David Preston, R. H. Ryall, Dr. A. G. G. Thompson and F. H. Waters, about thirty yards from the end of a farm lane bordered by tall hawthorn hedges on a salt marsh near East Park, Dumfriesshire. Our attention was attracted by the anxious calling of a Dunnock (*Prunella modularis*) and we saw that the bird was being pursued by a Great Grey Shrike (*Lanius excubitor*). For fully twenty minutes we watched a most persistent chase. The Dunnock fled through the hawthorns, darting from one thick bush to another; there was no ground cover into which it could disappear. The shrike, perhaps having failed to effect an initial surprise, following with great persistence through the bushes, stepping from twig to twig, keeping up with but never managing to overtake its prey. In flight it swooped low, rising to a perch in the typical manner. Often it flew round or between the bare trunks of the bushes to gain lost ground. Now and again, losing sight of its objective, it hovered over or by a bush, sometimes for as much as ten seconds; or perched erect, flexing its tail and looking round alertly, before renewing the chase. This went on without pause until, eventually moving to the near edge of an expanse of gorse, they

disappeared and were lost to sight. The determined chase and close pursuit by the shrike, weaving through the heart of thick bushes, were the most interesting features of the incident.

The northern race of the Great Grey Shrike is stated in *The Handbook* to take small birds as its main food. The Dunnock is not listed among these, however, and the method of capture is inferred to be by surprise swoop from a perch.

RALPH STOKOE

Review

The Deaths of Birds and Mammals connected with Toxic Chemicals in the first half of 1960. Report No. 1 of the Committee on Toxic Chemicals set up jointly by the British Trust for Ornithology and the Royal Society for the Protection of Birds (Chairman, Stanley Cramp; Secretary, P. J. Conder). Published, 1961, by the R.S.P.B., 25 Eccleston Square, London, S.W.1. 20 pages.

I write this after putting a cock Pheasant in the refrigerator. Externally in excellent condition, it had been brought to me by a neighbour who had watched its last moments. In other words, this report comes to hand just when the phenomena it describes for 1960 are being repeated in 1961. In the circumstances, readers will not expect the detached and objective viewpoint which should distinguish a scientific review.

The report compresses into eleven pages of text and tables—followed by an eight page appendix giving details of 67 “kills” (incidents in which a number of birds died)—the first absolutely hard evidence that certain chemical seed dressings are responsible for the widespread deaths amongst birds which have been observed during the past five years. For the first time, chemical analysis undertaken by a London firm of public analysts and consulting chemists has isolated lethal amounts of organic chlorine in the organs of birds found dead in areas where seed dressings containing it are known to have been used.

Hitherto this has been the missing link. Faced with totals of dead birds from areas where toxic chemicals are in use, didymous Authority in its several guises has stonewalled, crying “Show me! Show me!” Circumstantial evidence has not been accepted: the birds might have died of disease, or just given up living. The admitted difficulty and expense of detecting small amounts of lethal chemicals in a post mortem has been wonderfully convenient for those who, for various reasons, wish to take no action or to take it very slowly.

The report is written with a telling moderation. It summarises the evidence on 59 kills attributed to seed dressings and eight to spraying between December 1959 and June 1960. Except for one in Devon,

the 59 English kills lie east of a line from the Bristol Channel to Scarborough in agricultural Lowland Britain; the seven Scottish kills are in the farming counties of Aberdeen, Berwick and Perth; the one Welsh kill is in Flintshire.

This is a significant beginning and the next paragraph shows that the birds most often reported dead are ones well known to take grain or seeds—Pheasants, “Crows and Rooks”, Chaffinches, Partridges, Greenfinches and House Sparrows. Another important category is of predators, both birds and mammals. Dead birds are difficult to find and few systematic searches were carried out over known areas so it is hard to give any idea of the density of mortality. Five finches, “some” Rooks and 64 Woodpigeons in a plantation of one acre might have gathered there when moribund. But “8-10 small birds” found dead in one garden every day for a week suggest a very heavy general mortality in that area. These are two examples from a full page of incidents.

The assessment of deaths from spraying is even harder to make because American work has shown its effects to be cumulative. Death may be due to eating contaminated leaves, insects or soil organisms and it may be some time before the dose is fatal. But the eight cases reported contain good circumstantial evidence.

Under “The Causes of Death” the report dismisses a favourite red herring: disease. Only in space fiction could we accept an infection that kills sparrows, Pheasants, owls, Foxes and Hedgehogs and leaves no clinical traces. Or if there were such a plague, I should not be writing these words. The descriptions which follow, of behaviour in dying, are those I have recently observed myself. No one could say the birds were enjoying themselves. The sight of Rabbits affected by myxomatosis—yet continuing to eat and showing no obvious signs of suffering—provoked an overwhelming popular reaction. If more people saw these dying birds, history might well repeat itself.

The report then describes the chemical analyses already mentioned. Of six cases—three Woodpigeons, one Pheasant, one Jackdaw and one Chaffinch—the analyst wrote that he had “no hesitation whatever in saying that as a result of my analysis dressed wheat was the cause of their death. In the four cases in which a complete examination has been made both mercury and a chlorinated organic insecticide have been found to be present” and he goes on to lay most of the blame on the chlorine. Another table summarises analyses carried out by other bodies and relating to 34 kills; though not as critical as those made by the R.S.P.B. analyst, they offer strong support to his classic cases.

Final paragraphs refer to the cumulative and indirect effects of these preparations, including the deaths of predators, especially Foxes, and to the possible effect on the reproduction of birds with sub-lethal

doses. In conclusion the report asks the Government to assume future responsibility for the gathering of information on kills and for the expensive analyses required, and to take "immediate steps" before the damage to wildlife is irreparable.

This excellent, studiously moderate report implies two distinct aspects of the problem. There is the long-term effect on the populations of a number of birds and mammals, and there is the suffering involved. Most of the birds listed are common and several are recognised pests of agriculture; it may be argued that such species have good recuperative powers and will in any case be reinforced from areas of poor farming. This may be true, but the example of the Passenger Pigeon is a warning that no bird is immune from extinction under sufficient pressure. And some of the principal casualties are important game birds or species like the Chaffinch and Yellowhammer to which no one could wish harm.

But the issue of suffering cuts across all questions of economics. As a farmer put it to me, "I don't like sparrows any more than the next chap, but I don't like to see them die in this way." If another season's observations and analyses confirm the findings of 1960 so admirably presented in this report, the need for rigid control of seed dressings and toxic sprays and for urgent research into less lethal compounds and into possible repellents is something on which naturalists, sportsmen, "animal-lovers" and the majority of farmers will agree to unite, and which no Government can afford to deny.

BRUCE CAMPBELL

Letters

The "Lesser Scaup" affair

Sirs,—It was with considerable misgivings that I read the account of the shooting of the Sutton Courtenay duck, reported in *British Birds* (54: 49-54). In the past fifteen years the cold war between bird-watchers and protectionists on the one hand and ornithologists and collectors on the other has thawed considerably, very largely due to better optical equipment, improved field identification practice and, perhaps especially, the new techniques for catching birds and identification in the hand before release. Until this incident, confidence amongst bird-watchers was growing steadily and early news of rare birds was becoming more readily available.

In the present case, neither the original finders of the bird nor the officers of the local ornithological society were informed, let alone consulted, and a bird of doubtful species has been identified as a hybrid. Precisely what gain this will be to science is not clear unless the solution of any riddle can hide in this guise, but of the damage to

public relations there can be no doubt whatever. The day when the protectionist will unhesitatingly disclose the location of a rarity, a step which can give immense pleasure to hundreds of bird-watchers, has been postponed indefinitely; it is the more deplorable that this act was given official sanction by the Nature Conservancy.

C. A. NORRIS, *Chairman, West Midland Bird Club*

Sirs,—The "Lesser Scaup" affair has now, of course, taken the form of a national outcry. To avoid the emotional issues it would be as well to examine whether this unfortunate bird could have been identified without being killed.

Given it was difficult to identify in the field, surely the opinions of Drs. R. A. MacArthur and F. A. Pitelka should have been respected. Their views should have squashed those who were hopeful that they had seen a rare visitor from America. The photograph (*Brit. Birds*, 54: plate 9) shows that the mantle is quite distinct from that of either Scaup (*Aythya marila*) or Lesser Scaup (*A. affinis*). Was this not noticeable in the field? If comparison were needed, could not the Wildfowl Trust have been persuaded to lend a Lesser Scaup from their collection so that it could be released on the same pool as the Sutton Courtenay bird? Surely the differences in "jizz" would then have been apparent. Lastly, was every effort made to trap the bird?

If the above measures could not have established its actual identity they would have established that it was not a Lesser Scaup. Even with the specimen available one can only *presume* that it was a hybrid Tufted Duck \times Pochard (*A. fuligula* \times *A. ferina*).

Shooting the Sutton Courtenay duck seems, therefore, to have been purposeless. Presumably those responsible for obtaining the specimen needed to salve their consciences by getting permission from the Nature Conservancy before doing so. Would they have been beyond their rights in killing it without this permission? A. R. M. BLAKE

Sirs,—I wish to protest strongly against the shooting of the Sutton Courtenay duck, at first thought to be a Lesser Scaup (*Aythya affinis*), revealed in the article by Christopher Perrins in your February issue. The shooting of a bird for any purpose is quite contrary to the spirit of contemporary amateur ornithology and it is surprising to find that it was not only condoned but approved by ornithological officialdom. I do not deny that the Nature Conservancy should have authority to grant shooting licenses for serious investigations by professionals, or by professionals and amateurs working together. But in the present case I contend that there has been a serious error of judgement since the gain in knowledge from the professional ornithologist's point of view must surely be trivial: what was a living presumptive hybrid is

now a dead one, though I admit that the degree of presumption is considerably stronger.

If the bird *had* to be shot there are two other grounds of complaint. It was thoughtless, to say the least, not to have informed the local ornithological society, who reported the appearance of the bird, or the watchers, Mr. B. Rose, Mr. A. D. Le Claire, Mr. L. Salmon and myself, who found it and had been keeping it under observation, hoping indeed that it would have turned up again this winter. The first intimation we had that it had been shot was the appearance of your February issue. However, we are glad to acknowledge an apology on this score from Mr. Perrins.

More important from a scientific point of view is the failure to take the opportunity for further investigation. The remarkable specificity of immunological reactions, and also of contemporary techniques for the partition of haemoglobins and serum components, might well have afforded a means of testing the hybridity hypothesis and of identifying the parental species. It may be that among the bird watchers of this country who are also laboratory biologists there is someone who would have been able to carry out a brief investigation of this kind and pleased to put his professional expertise at the service of his hobby. Study of the bird's chromosomes might have been no less revealing. In particular, there would have been the possibility of identifying a hybrid meiosis in the primary spermatocytes of the testes. This I would gladly have undertaken myself.

Though I am opposed both to the shooting of this bird and to the manner of its doing, nothing I have written here is intended to reflect on the competence of Mr. Perrins's paper or to be regarded as dissent from the conclusions he has drawn.

C. E. FORD

[We have received various comments on this subject, a number of them actively supporting the killing of this particular bird, but only these three letters have actually been sent for publication. In view of the widespread interest in the matter and the number of comments in the national press, we reproduce below (by permission) a letter from the Director-General of the Nature Conservancy to the Secretary of the Royal Society for the Protection of Birds, explaining the circumstances in which the licence to shoot the bird was issued.—EDS.]

The Nature Conservancy,
19 Belgrave Square,
London, S.W.1
21st March, 1961

Dear Secretary,

Thank you for explaining the views of your Council on the incident of the bird now held to be a hybrid Tufted Duck \times Pochard at Sutton Courtenay. In view of the public interest which has been shown, a considered statement of the Nature

Conservancy's responsibilities and policy on such matters may help to clear up misunderstandings.

As the Royal Society for the Protection of Birds will be aware, it is only very recently that the reliability of sight identifications of wild birds in Great Britain has been brought up to a level sufficient to ensure their general acceptance as scientifically valid evidence of distribution. In some countries criticism by professional ornithologists of our move over to almost complete reliance on sight records has not entirely ceased. It is, however, recognised by most informed people that improved methods of identification, where necessary assisted by live trapping and controlled by the skilled and critical work of editors of local reports and their national counterparts, do yield a high degree of reliability. British ornithologists are entitled to feel proud of this achievement which is often taken for granted by those unfamiliar with the severe difficulties of satisfying exacting scientific requirements without the evidence which in the past was regarded as indispensable. It is now only in the most exceptional cases that any question still occurs of choosing between the shooting of a bird for identification purposes or leaving the identification uncertain.

Such exceptions must, however, from time to time arise and differences of opinion naturally arise with them. At one extreme it is held that no rare birds should ever be shot at any time for any purpose; at the other it is argued that there is always some element of inconclusiveness about sight records and that a museum specimen is the only satisfactory scientific evidence in cases where room for error over a sight identification exists. A middle view might be that it is a lesser evil to be left uncertain than to kill a bird where it is simply a question of adding to some doubtfully significant list of local rarities, and that collecting is only justified where it appears to be the only practical means of setting at rest some point of serious scientific interest.

Until 1954 any such decisions had to be taken on their own responsibility by individual ornithologists, often without too much regard for the law which was, in any case, somewhat of a dead letter. This was generally felt to be most unsatisfactory and in the Bill which became the Protection of Birds Act 1954 powers were included for the granting of licences to kill or take specified birds in specified areas for scientific or educational purposes. Parliament thus clearly envisaged that scientific needs were not to be hampered by the general provisions of the Act any more than bird-marking was to be hampered by prohibition of capture of wild birds to be released after being ringed. It was in connection with this responsibility of licensing such exceptions as may be necessary for scientific work that the Nature Conservancy issued a licence to Dr. I. C. T. Nisbet in February 1960. Dr. Nisbet is an accomplished scientist with an outstanding record as a field observer of birds and has made a special study of transatlantic movements. The question whether this and certain other individuals were actually (as had been claimed) Lesser Scaups from North America or some sort of hybrid and if so, what, was therefore peculiarly within his province. It was only after the most careful and prolonged effort to find some alternative solution that he applied to the Nature Conservancy for a licence. As several similar birds had given rise to much confusion and uncertainty which the Wildfowl Trust were unable to set at rest in the light of their specialist knowledge of the group, the Director-General of the Nature Conservancy, who is himself an ornithologist, was satisfied that (as the bird could not be caught alive) the problem could only be cleared up by shooting it and that the problem was of sufficient scientific importance to entitle Dr. Nisbet's application to succeed. When the bird was shot on 3rd March 1960, it proved that the ornithologists who had viewed it as a rare visitor were wrong and that those who had suspected it to be a hybrid were right. It was identified as a hybrid between two common British species, the Tufted Duck and Poehard, and as such could perfectly legally have been

shot by anyone without the least formality at any time during its stay before the close season. Had this been done, however, and had the identification proved otherwise, a risk of prosecution would have been run and it was precisely to protect scientists against such risks in the course of their researches that Parliament had provided for licences.

I trust that what I have said will satisfy your Council that, as they have indeed themselves envisaged, the Conservancy were actuated in this case by special circumstances which may not recur. It would not be right for the Conservancy to give undertakings which would prevent them from dealing with any future exceptional circumstances on their merits, but I think I can properly say that, in my executive duty of issuing licences in fulfilment of the Conservancy's policy, I do not regard simply placing the identity of a rare visitor beyond doubt as a type of serious scientific purpose for which a licence should be given to anyone and I would confirm that the Conservancy have not hitherto used or contemplated using their licensing powers in such a way.

The Conservancy have, as your Council themselves anticipate, been fully alive to the consideration that reporting of the presence of rare birds should not be discouraged by fears of bringing about their elimination. In this case, however, a rare bird was not involved although it appears that some of the criticism expressed is related to the contrary assumption, which was shot down by Dr. Nisbet.

Yours sincerely,

E. M. NICHOLSON,
Director-General

The Secretary,
Royal Society for the Protection of Birds,
25 Eccleston Square,
London, S.W.1

"The Helsinki Congress and the future"

Sirs,—I read with attention the exemplary utterances of your eminent reviewer and, later, of various correspondents on the subject of international congresses (*Brit. Birds*, 53: 447-452 and 583-584; 54: 80-92) and was filled with righteous indignation at the behaviour of my countrymen and myself. Then, like a bracken frond uncurling in spring, a doubt, small but vigorous, began to work within me.

Since E.M.N. made such good use of this form of speech, perhaps I may be allowed to phrase my doubt as a question: are we not taking our ornithology just the tiniest bit too seriously? Reading E.M.N.'s review with the key words blocked out, I believe you could imagine he was referring to some crisis in the affairs of the M.C.C. or the Football Association and thus putting the traditional hobby of the introvert and the escapist on the same high plane as the traditional games of the extrovert.

That, sirs, would be a chilling apotheosis. For many of us bird-watching, whether pursued scientifically or as a relief from outside pressures, is still, unrepentantly, fun. Missing talks at congresses (and did I not meet some of your august Table on the road to Porkkala?) revives the thrill of cutting University classes; lobbying the representatives of other nations at receptions gives enormous pleasure to our less active seniors; even open rows are usually enjoyed

by those who go in for them. Are we—how these questions get hold of one!—really to rationalise and organise and streamline future congresses until they work as smoothly as the Nature Conservancy? Or, to apportion my blows equally, will it not be a sad day when the bird-watchers of Britain, the home of amateurism and its attendant delightful muddles, permit themselves to be, as Dr. Bourne would evidently like, dragooned and selected like so many experimental fruit flies?

BRUCE CAMPBELL

[We are glad to learn from the President of the National Audubon Society of America that it is proposed to organise a special ornithological tour through Florida and Texas in 1962 for those who wish to see as many interesting New World birds as possible while visiting the XIII International Ornithological Congress which, as we announced last month (*Brit. Birds*, 54: 132), is to be held at Cornell University in June of that year.—EDS.]

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

[These are largely unchecked reports, not authenticated records]

The last summary covered the two months up to mid-December (*Brit. Birds*, 54: 44-48). Shortage of space (and time!) prevented any "Recent reports and news" in the last two issues, although the first quarter of 1961 proved a remarkably interesting period with an exceptional outbreak of early nesting from late January onwards, unusual numbers of certain waterfowl, some very early summer visitors, and a notable scattering of rarities. It is hoped to deal with some of the other subjects in our next issue, but this month we are confining ourselves to a summary of the rare species, which have included vagrants from Asia, America and southern Europe.

LATE DECEMBER AND JANUARY

The autumn of 1960 was one of the most remarkable on record for American and other Nearctic birds in Britain and Ireland (*Brit. Birds*, 53: 405, 454-455, 533-534; 54: 44-45), and December postscripts were provided by a **Sabine's Gull** (*Xema sabini*) on the Ards Peninsula between Portavogie and Cloughey (Co. Down) on the 4th and by the first record of a **Yellow-billed Cuckoo** (*Coccyzus americanus*) since 1953, one being picked up dead at Middleton (Sussex) on the 14th. From America we turn to Asia: it was on 1st January that a **Greenish Warbler** (*Phylloscopus trochiloides*) was discovered at Perry Oaks (Middlesex); its identity was confirmed on 5th February and it was then seen by a large number of observers up to 26th February—an astonishing occurrence of a bird which at this time of year should have been in India. No less unseasonal, however, was the **White Stork** (*Ciconia ciconia*) at Cheshunt and Wormley (Hertfordshire) from 3rd December to 15th January; enquiries suggest that it may not have been an escape (although one at Manston in Kent in February almost certainly was), but by this date it should have been thousands of miles away in Africa. Another Asiatic species at this time was a **Richard's Pipit** (*Anthus novaeseelandiae*) on Halstow Marshes (Kent) on 3rd January. On 26th December a **Tengmalm's Owl** (*Aegolius funereus*) was observed very closely

BRITISH BIRDS

at Cruan Firth (Orkney) and it was seen there again on the 27th and on 1st January. **Ferruginous Ducks** (*Aythya nyroca*) continued to be reported in December and January and, apart from those already mentioned (*Brit. Birds*, 54: 47), at least three were identified in Lancashire, at Heysham, Leigh and Pennington Flash, while another was seen at Frensham Pond (Surrey).

FEBRUARY

February was the time of the waterfowl. Since November, the winter had been noteworthy for unusual numbers of **Bewick's Swans** (*Cygnus columbianus bewickii*), but these reached an all-time high in late February when there were 200 in the Derwent Valley (Yorkshire) on the 20th and 708 in the Ouse Washes (Cambridgeshire/Norfolk) on the 26th. Several very rare ducks and geese were also recorded. Most remarkable of these was an American **Black Duck** (*Anas rubripes*) on the North Slob (Co. Wexford) from 18th to at least 21st February; there is only one previous European record (*Brit. Birds*, 48: 341). The same place provided another American bird at the same time—a blue phase **Lesser Snow Goose** (*Anser c. caerulescens*) from the 17th to at least the 21st. The same period, 17th–21st February, saw an adult **Lesser White-fronted Goose** (*A. erythropus*) (an arrival from the opposite direction) at Slimbridge (Gloucestershire) and for several days from the very end of the month (28th February onwards) there was a drake **Buffelhead** (*Bucephala albeola*) at Fosote Reservoir, near Maids Moreton (Buckinghamshire); there is a strong likelihood, however, that this last was an escape from Holland.

Waterfowl were not the only American species in February, however, as a **Lesser Yellowlegs** (*Tringa flavipes*) was claimed at Tayport (Fife) on the 7th. Other rarities of the month included a **Nutcracker** (*Nucifraga caryocatactes*) at Holland-on-Sea (Essex) on the 20th; and adult **Mediterranean Black-headed Gulls** (*Larus melanocephalus*) at Dungeness (Kent) and Cley (Norfolk) on the 16th and 19th.

MARCH

March opened with the discovery at Titchfield Haven (Hampshire) of a bird which later proved to be a **Cetti's Warbler** (*Cettia cetti*), the first live record for the British mainland. It was found on the 4th, trapped on the 19th and still present on 8th April. It will be remembered that a Cetti's Warbler was ringed in the Channel Islands in October (*Brit. Birds*, 54: 45), following a northwards push by this species in France last autumn. Hardly less remarkable was a **Yellow-browed Warbler** (*Phylloscopus inornatus*) at The Naze (Essex) on 16th March, for this species is very seldom recorded in Europe in spring, certainly not thus early when it should be in south-east Asia. Another American bird appeared this month: a drake **Green-winged Teal** (*Anas crecca carolinensis*) at the Midrips (Sussex) and on Walland Marsh (Kent) from 19th to 22nd March. **Mediterranean Black-headed Gulls** were seen at Folkestone (Kent) from 8th to at least 23rd March (a first-winter bird) and at St. Ives (Cornwall) from the 21st to 24th. There was also an adult **Caspian Tern** (*Hydroprogne caspia*) at Folkestone on the 16th.

APRIL

Single **White-spotted Bluethroats** (*Cyanosylvia svecica cyanecula*), adult males in each case, appeared at The Lizard (Cornwall) and Sandwich Bay (Kent) at the turn of the month, on 31st March and 1st April respectively. However, the first few days of April really belong to two much rarer species of considerable interest. On the 6th a **Sociable Plover** (*Chettusia gregaria*) was identified near Wimborne (Dorset); it had first been seen by local people a week or two earlier and it was still present on the 20th. Rarer still was the **Calandra Lark** (*Melanocorypha calandra*) which spent the whole of the 2nd at Portland Bill (Dorset).

Notice to Contributors

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.
2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.
3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.
WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34. Various other conventions concerning references, including their use in the text, should be noted by consulting examples in this issue.
4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.
5. Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.

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by British bird-photographers
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Three
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May
1961

British Birds

AN ILLUSTRATED MONTHLY JOURNAL

Edited by

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I. J. Ferguson-Lees Stanley Cramp

Photographic Editor: Eric Hosking

Hon. Editors: W. B. Alexander N. F. Ticehurst

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British Birds

Vol. 54 No. 5

MAY 1961



Report on rare birds in Great Britain in 1960 (with 1958 and 1959 additions)

*Compiled by G. A. Pyman
on behalf of the Rarity Records Committee*

OUR FIRST TWO REPORTS (*Brit. Birds*, 53: 153-173 and 409-431) covered 1958 and 1959 records respectively. With this, our third, we have finally brought publication up to date and made up the eighteen months of arrears which had to be tackled when our Committee began work in the middle of 1959. The list of species concerned was published in August 1959 (*Brit. Birds*, 52: 242-243), but it has since been slightly altered and so we are printing a revised version later in this report (see Appendix 1 on pages 197-198), which will also assist new readers. We are continuing to include records of certain subspecies, but only ones which are both excessively rare in this country and show characters which are sufficiently distinctive in the field.

For 1958 we received about 370 records of birds on this list and for 1959 some 430. As the number of competent observers continues to increase and trapping and identification techniques go on improving, it is not surprising that for 1960 the figure rose still further to over 500. These records came to us from many individual observers, as well as from the editors of the various national and county publications and the bird observatories. We have now reached a decision on all but 17 of them, but we know of another eight which we have been unable to consider because we have not yet received any details. There was a similar residue of outstanding records in both 1958 and 1959, but we have now obtained the necessary data for the majority of them and only 11 observations for one or other of those years remain to be cleared. Thus a small number of additions and corrections for 1958 and 1959 are included in this report which otherwise lists the accepted 1960 records for England, Scotland and Wales.

It will be noted from the heading to this report that we are no longer dealing with Irish records. This is a matter of profound regret to us because the geographical positions of Britain and Ireland, in relation to each other and to the Continent, essentially make these islands a zoological unit, particularly where bird migration is concerned. However, in spite of our willingness to increase the Irish representation on the Committee, certain groups are determined not to co-operate because they wish Irish standards alone to be applied to Irish records. We have thus been faced with deciding whether to include only a proportion of Irish observations in these annual reports or whether to confine them to England, Scotland and Wales. As one of the main aims of these summaries of the occurrences of rare birds is to present a complete picture, and as our participation in perhaps two-thirds of the Irish records but not the remainder would put the editor of the *Irish Bird Report* and the committee dealing with Ulster records in an impossible situation, we have had no alternative but to adopt the latter course. For the moment, therefore, all records for both Ulster and Eire, including those from the four Irish bird observatories and any occurrences reported by British observers visiting Ireland, are being excluded from these reports. We hope that it will one day be possible to reverse this decision.

Before we leave this subject, it must be emphasised that our decision affects only these annual reports on rare birds. The Committee is more than willing to help unofficially over any Irish records on which its advice is sought and the editors of *British Birds* hope that full details of the extreme rarities (species which have occurred in Britain and Ireland less than ten times) will continue to appear as separate notes in this journal.*

The Committee now consists of P. A. D. Hollom (Chairman), G. A. Pyman (Hon. Secretary), H. G. Alexander, I. J. Ferguson-Lees, D. D. Harber, A. Hazelwood, Prof. M. F. M. Meiklejohn, I. C. T. Nisbet, K. D. Smith and Kenneth Williamson. We were glad to be able to welcome back H. G. Alexander on his return to this country at the end of November 1960, but soon afterwards a conspicuous gap was left in our ranks when Major R. F. Ruttledge ceased to be a member as a result of the decision regarding the Irish records. We cannot let this reference to Major Ruttledge pass without expressing our appreciation of the highly valued services which he whole-heartedly rendered while a member of the Committee. We are only sorry that the pressure of his ornithological work in Ireland always made it impossible

*It should also be made clear that migration and other analyses will continue to include Irish records as far as possible, and the "Recent reports and news" will still aim to cover all four countries.—EDS.

for him to devote time to any but Irish records, for his advice on the British ones would have been no less valuable.

The principles by which we are guided and the procedure we have adopted in considering records were set out at some length in our first report (*Brit. Birds*, 53: 155-156). In our second (53: 410) we explained how important it is that we should be given an opportunity of judging the observer's own complete notes rather than an edited or abridged version prepared by the local recorders. We are pleased to be able to say that a much higher proportion of the records were submitted in this form in 1960 than in either of the previous two years and we hope that this trend will continue.

The systematic list below is set out in the same way as its predecessors. The following points, some of which are explained more fully in the introduction to our 1958 report (*Brit. Birds*, 53: 156-158), should be borne in mind since they indicate the basis on which the information contained in the list has been prepared:

(i) Basic details for each record are (1) county; (2) locality; (3) number of birds if more than one, together with age*/sex if known; (4) if trapped or found dead; (5) date or dates; and (6) observer or observers up to three in number, in alphabetical order. Any other relevant information and comments, e.g. on the subject of escapes from captivity, are included in a separate paragraph underneath. Where details of an accepted record do not rule out the possibility of a different species of very similar appearance which is not on the British and Irish list, this is stated below it; in most of these cases the other species belongs to some distant part of the world and the chances of its arrival here are extremely remote.

(ii) Occurrences of species and some well-defined races that have been recorded in Great Britain and Ireland (a) not more than ten times or (b) not at all during the previous 25 years are still published separately in this journal with full descriptions. British records in this category are, therefore, mentioned only briefly in the systematic list below and cross-referenced to the fuller publication.

(iii) The scientific nomenclature and classification follows that given in the B.O.U. *Check-list of the Birds of Great Britain and Ireland* (1952), with the amendments subsequently proposed (*Ibis*, 98: 157-168) and those resulting from the decisions of the International Commission for Zoological Nomenclature (*Ibis*, 99: 369). Any sight records of subspecies (including those of birds trapped and released) are normally referred to only as "showing the characters" of the race concerned.

(iv) No record which would constitute the first for Great Britain and Ireland is published by us, even if we consider it acceptable, until it has been passed by the Records Committee of the British Ornithologists' Union. Three records in this category are at present under consideration.

(v) As a general rule, the report is confined to records which are considered to be specifically certain; and no "probables" are admitted (square brackets being used solely to indicate escapes from captivity). However, we are continuing to publish indeterminate observations in the cases of the very similar Short-billed and Long-billed Dowitchers (*Limnodromus griseus* and *scolopaceus*) on the one hand and Melodious

*The expression "adult" is used in the systematic list to denote adult plumage irrespective of whether a bird has reached full maturity.

and Icterine Warblers (*Hippolais polyglotta* and *icterina*) on the other, where we are satisfied that one of these species is involved without its being possible to say which. Similarly, in certain special cases—for example, those of frigate-birds (*Fregata* spp.) and albatrosses (*Diomedea* spp.)—we have now decided also to consider records of extremely rare birds which have only been generically identified. Such records, although indeterminate, do have a significant place in the general pattern which it is one of the main aims of these annual summaries to reveal.

Once more we wish to place on record our sincere appreciation of the co-operation extended by the vast majority of local organisations and individual observers who have assisted us in divers ways. We are anxious that our 1961 report should appear early in 1962 and, with this aim in mind, we again express the hope that full details of each rarity will be sent to I. J. Ferguson-Lees (or to Kenneth Williamson in the case of the observatories) as soon as possible after the event and not held back until the end of the year. We shall also be grateful if readers will notify us of any errors in the systematic list so that they can be corrected later. We recognise that the earlier our reports are published the greater is the likelihood that mistakes—especially over dates—will occasionally occur, but we feel confident that our readers will regard a few minor (and amendable) errors as a small price to pay for comparatively prompt publication.

Supplementary systematic list of 1958 records accepted

1958

Purple Heron (*Ardea purpurea*)

Isles of Scilly: a first-summer bird on St. Mary's on 21st April and on St. Agnes during 22nd-24th April (J. C. Eaton, F. H. D. Hicks, J. L. F. Parslow *et al.*).

Great Snipe (*Gallinago media*)

Isles of Scilly: St. Agnes, 26th October (K. H. Hyatt, B. S. Milne, B. P. Pickess).

Mediterranean Black-headed Gull (*Larus melanocephalus*)

Suffolk: Lowestoft, adult, 12th October 1958-15th March 1959 (R. W. Coleman *et al.*) (see below).

Short-toed Lark (*Calandrella cinerea*)

Isles of Scilly: St. Agnes, two, 10th May (G. J. Harris, E. J. Pilcher).

Subalpine Warbler (*Sylvia cantillans*)

Isles of Scilly: St. Agnes, ♂, 3rd-7th May (W. L. Hicks, C. J. Mortimore, B. P. Pickess *et al.*).

Tawny Pipit (*Anthus campestris*)

Isles of Scilly: St. Agnes, adult, 10th September (R. E. Emmett, J. L. F. Parslow, G. L. Scott *et al.*).

Little Bunting (*Emberiza pusilla*)

Isles of Scilly: St. Agnes, 27th March (C. A. Walker, P. J. Wilson).

*Supplementary systematic list (with corrections)
of 1959 records accepted*

Steller's Eider (*Polysticta stelleri*)

1959

Sutherland: Loch Fleet, ♀ or immature ♂, 22nd September (P. Glazier, D. Jenkins *et al.*).

As details have already appeared in *Scottish Birds* (1: 234-235), it is not proposed to publish a full description in this journal, although this species has been recorded only five times previously in Great Britain and Ireland (*cf.* page 175, ii).

Lesser White-fronted Goose (*Anser erythropus*)

Gloucestershire: Slimbridge, two adults, 14th-27th February and 15th February-21st March; one during 4th-13th April may have been a third individual (L. P. Alder, Hugh Boyd, M. Davy *et al.*).

Crane (*Megalongis grus*)

(Correction): We now learn that the bird which was resident at Teesmouth (Co. Durham) during the summer and autumn of 1959 (*Brit. Birds*, 53: 417) was first seen on 4th August and *not* 29th July as previously published.

Co. Durham: between Sedgfield and Coxhoe, two, 28th November-1st December (J. Morgan, A. Taylor, B. Tucker).

Pembrokeshire: Marloes, immature, 30th October (J. H. Barrett, Mrs. R. Barrett *et al.*).

Little Crake (*Porzana parva*)

Norfolk: Brinton, ♂, 15th November and on several subsequent dates to 14th January 1960 (R. P. Bagnall-Oakeley).

Mediterranean Black-headed Gull (*Larus melanocephalus*)

Suffolk: Lowestoft, adult, 12th October 1958-15th March 1959 (see above); also adult, 11th October 1959-19th March 1960 (R. W. Coleman *et al.*).

1959 was the fourth successive year in which what was presumably the same individual appeared in this locality.

White-winged Black Tern (*Chlidonias leucopterus*)

(Correction): The bird reported at Radipole Lake, Weymouth (Dorset), during 19th-21st August (*Brit. Birds*, 53: 420) was also seen on 22nd August (Rev. G. W. H. Moulc).

Alpine Swift (*Apus melba*)

Isles of Scilly: St. Agnes, 6th October (B. S. Milne, R. E. Scott).

Roller (*Coracias garrulus*)

Isles of Scilly: St. Agnes, 22nd-23rd October (B. S. Milne).

Bearded Tit (*Panurus biarmicus*)
(elsewhere than in East Anglia)

(Correction): The reference to the occurrence of this species at Marsworth Reservoir (*Brit. Birds*, 53: 422) should have appeared under "Hertfordshire" instead of "Buckinghamshire". However, we now learn that the birds were first seen in this locality in early November 1959 (Miss P. Hager) when they were actually occupying Buckinghamshire territory.

Kent: Gravesend/Northfleet, ♂, 13th December 1959-3rd January 1960 (R. J. Fearn, E. H. Gillham, R. E. Ingram *et al.*).

Aquatic Warbler (*Acrocephalus paludicola*)

Isles of Scilly: St. Agnes, trapped, 16th and 18th September (P. C. Bance, W. E. Brewer, M. E. Nolan *et al.*).

Icterine Warbler (*Hippolais icterina*)

Lincolnshire: Gibraltar Point, trapped, 22nd August (C. T. Beverley, D. Hill).

Yellow-browed Warbler (*Phylloscopus inornatus*)

Hampshire: Avington, 30th November (D. W. L. Hubble).

Woodchat Shrike (*Lanius senator*)

Isles of Scilly: St. Agnes, adult ♂, 13th and 15th May (G. L. Scott); immature, trapped, 20th August (A. D. Brewer, M. J. Mackmin, R. N. F. Simpson); Tean, adult, 7th September (Mrs. R. Douglas-Jones).

Rose-coloured Starling (*Sturnus roseus*)

Hampshire: Pilmoor Gate Heath, New Forest, adult, 14th March (J. K. Bowers, G. H. Rees, B. Rozzell).

In view of the somewhat unusual date of this occurrence we must again draw attention to the fact that Rose-coloured Starlings are regularly imported in captivity (see also page 195 below).

Systematic list of 1960 records accepted

Little Shearwater (*Procellaria baroli*)

Norfolk: between Cley and Blakeney Point, freshly dead bird of Madeiran race (*P. b. baroli*), 1st May; now preserved in the British Museum (Natural History) (*Brit. Birds*, 54: 39).

Purple Heron (*Ardea purpurea*)

Devon: Plym Estuary, immature, 7th-15th October (L. I. Hamilton, F. R. Smith, N. A. Wesley *et al.*).

Sussex: Cuckmere Haven, adult, 27th April (R. H. Charlwood, G. T. Chater).

Little Egret (*Egretta garzetta*)

Devon: Topsham, 20th May (R. F. Moore, R. M. Moore).

Hampshire: Titchfield Haven, 29th May (M. J. Carter, A. B. Sheldon, Dr. C. Suffern *et al.*).

As already pointed out (*Brit. Birds*, 53: 159 and 413), it is conceivable that the Snowy Egret (*E. thula*) of North America—from which the present bird is inseparable in the field—might occasionally cross the Atlantic.

Night Heron (*Nycticorax nycticorax*)

Anglesey/Caernarvonshire: Menai Straits, immature, 7th February (probably earlier)-11th March (H. N. Parsons, N. Picozzi, L. S. V. Venables *et al.*).

Devon: River Otter, near Budleigh Salterton, adult, 21st April (R. H. Baillie).

Dorset: Radipole Lake, Weymouth, freshly dead adult, 18th April (R. Chainey, A. Jones).

Norfolk: Hoveton Great Broad, near Wroxham, adult, 12th June (C. Jolly).

Fife: Isle of May, adult, 14th May (P. Todd, T. Todd, W. Watt).

In our 1958 report (*Brit. Birds*, 53: 159-160), we recalled that Night Herons were open to the suspicion of being escapes from Edinburgh Zoo, where there is a colony in an aviary which has had no roof since 1951 (see also D. F. Dorward, 1957, *Scot. Nat.*, 69: 32-36). At the same time we pointed out that the species had established itself in Holland in 1946. There have since been several further reports from the immediate vicinity of Edinburgh which fairly obviously refer to birds from the Zoo, but the Isle of May individual mentioned above (which was first seen flying in from the east) may conceivably have been of Continental origin, especially as the fact of there being three other records in the spring or early summer of 1960 suggests the possibility of a slight influx. It is also relevant to mention that one was seen by C. Clapham on 29th and 30th April 1960 on Ushant off the coast of Finistère (France); we understand that the species had

not previously been reported from that island. In view of the time of year, the length of its stay and its nocturnal roosting, the Menai Straits individual is perhaps as likely as any to have wandered from Edinburgh.

Little Bittern (*Ixobrychus minutus*)

Hampshire: Titchfield Haven, two, 21st-22nd May (A. Y. Norris, Dr. C. Suffern, N. G. Wyatt *et al.*).

Huntingdonshire: (locality suppressed), a pair seen and heard on various dates between 21st June and 19th July at a gravel pit where there are several acres of reed-beds; the female was little in evidence during the second fortnight (P. Forster, R. H. Forster).

White Stork (*Ciconia ciconia*)

Hampshire: Cosham, 28th May (M. Bryant).

Hertfordshire: one at Cheshunt, 3rd-17th December (O. C. J. Butt, B. S. Nau, C. Wisley *et al.*), and 2-3 miles away at Wormley, 26th December (R. Broad) and 15th January 1961 (C. Wisley).

Kent: Richborough Marshes, 24th-29th May (Dr. J. R. Rose); Grove Ferry, 26th May (D. F. Musson, R. G. Pitt); probably two different individuals.

The dates of the Hertfordshire bird are most unusual because this species is mainly a summer visitor to Europe. B. L. Sage has undertaken extensive enquiries on our behalf, however, and it appears unlikely that it had wandered from a collection. Nevertheless, the possibility that it was an escape cannot be ruled out entirely.

Teal (*Anas crecca*)

Yorkshire: Eccup Reservoir, ♂ showing the characters of the American race known as the Green-winged Teal (*A. c. carolinensis*), 19th February (G. R. Naylor).

Blue-winged Teal (*Anas discors*)

Pembrokeshire: Skokholm, ♀ or immature ♂, 17th September (I. R. Downhill, K. D. Smith).

Few Blue-winged Teal are to be found in collections and, in view of their rarity and value, it is unlikely that any would be allowed to escape. At the same time it should be mentioned that the description does not eliminate the Cinnamon Teal (*Anas cyanoptera*). This species is not uncommonly kept in captivity in this country, and females and juvenile drakes are difficult to distinguish in the field from the corresponding plumages of the Blue-winged Teal, though in most individuals the basic colouring is much warmer.

Red-crested Pochard (*Netta rufina*)

(elsewhere than in the London area)

Berkshire: Woodley gravel-pit, ♂ and ♀, 12th March (J. T. R. Sharrock).

Derbyshire: Locko Park, Spondon, 23rd July-12th October (R. H. Appleby, F. G. Hollands *et al.*).

Essex: The Naze, ♂, 16th January (P. Pearson); R. Stour Estuary, ♂, 1st May (W. E. Richardson); Abberton Reservoir, ♀, 18th August (A. J. Gaston); reported on many dates between 11th September and 22nd November—three (one ♂) on 11th September (R. G. H. Cant), numbers thereafter rising to six (♀♀) by 30th September (M. S. J. Snoxell), to nine by 12th October (R. V. A. Marshall) and to a maximum of 19 (four ♂♂) by 16th October (R. W. Gardiner, S. E. Linsell); 4-9 during the remainder of October and 2-4 (one ♂) between 3rd and 13th November; two ♂♂, 22nd November (R. V. A. Marshall); Little Oakley, ♂, 12th October (F. R. Clemance); Hanningfield Reservoir, three (one ♂), 6th November (R. E. C. Collins, D. J. Gordon).

Gloucestershire: Fairford, ♀, 4th January (C. M. Swaine).

Lincolnshire: Langtoft gravel-pits, ♀, 15th May (R. L. K. Jolliffe, P. J. Tizzard).

Oxfordshire: Stanton Harcourt, as previously reported (*Brit. Birds*, 53: 415), ♂, 19th December 1959-10th April 1960; two ♂♂, 4th September—at least mid-October (E. L. Jones, M. H. Rowntree); Dorchester gravel-pit, two ♂♂ (one immature), 14th February, immature ♂ remaining to at least 21st February (W. D. Campbell, N. Williams).

Sussex: Chichester gravel-pits, ♀, 24th January (D. Langford); Manhood End, ♀, 3rd April (M. H. Port, A. B. Sheldon *et al.*).

Warwickshire: Edgbaston Park, Birmingham, ♂, 20th July (R. W. Butler, D. A. Whitehouse).

Reference should again be made to G. A. Pyman's paper (*Brit. Birds*, 52: 42-56) on the status of this species in Great Britain and Ireland. There can scarcely be any doubt that the concentration at Abberton Reservoir, like others there in previous years, was composed of wild visitors from Holland or the Baltic. On the other hand, certain of the inland occurrences listed above, particularly those in Derbyshire and Warwickshire, are perhaps more likely to refer to escapes than to wild birds.

Ferruginous Duck (*Aythya nyroca*)

Berkshire: Theale gravel-pits, adult ♂, 7th February (D. Bradley, R. A. F. Gillmor, J. T. R. Sharrock *et al.*).

Kent: Dungeness, first-winter ♂, 8th November-4th December (D. D. Harber, P. Hope Jones, R. E. Scott *et al.*).

Lancashire: near Morecambe, ♂, 17th-30th January (L. Eccles, H. Shorrocks); Pennington Flash, near Leigh, ♂, 9th November and on a number of subsequent dates to at least 5th February 1961 (L. G. Brook, J. P. Wilkinson *et al.*); Heysham, ♀ or immature ♂, 3rd-22nd December, and adult ♂, 5th-11th December (K. E. Haguc, P. Cook, H. Shorrocks *et al.*).

London: St. James's Park, adult ♂, 12th August (E. H. Gillham).

Middlesex: Brent Reservoir, adult ♂, 8th-11th September (L. A. Batten, P. L. Britton *et al.*).

Nottinghamshire: Holme Pierrepont gravel-pits, ♂, 8th December 1960-4th January 1961 (R. B. Beck, P. H. Hope, W. Priestley).

Staffordshire: Gailey Reservoir, immature ♂, 22nd-29th February (A. R. M. Blake, W. E. Oddie, D. A. Whitehouse *et al.*).

Surrey: Barn Elms Reservoir, adult ♂, 10th-27th January (R. Cordero, M. D. Kingswell, D. I. M. Wallace *et al.*).

Warwickshire: Edgbaston Park, Birmingham, immature ♂, 30th April-3rd May and 9th-13th May (W. E. Oddie, D. A. Whitehouse).

Yorkshire: Hornsea Mere, ♂, 5th January (G. R. Naylor); Harewood Park, ♀, 7th February (A. H. B. Lee).

As indicated in our 1959 report (*Brit. Birds*, 53: 415), it is clear that there was a sizeable influx of Ferruginous Ducks during the winter of 1959-60. Even so, it is virtually impossible in any particular instance to be sure that the bird concerned had not escaped from a collection. In this connection, we are indebted to J. L. F. Parslow for advising us that a number of Ferruginous Ducks and Ferruginous Duck × Pochard hybrids were reared in Regent's Park, London, in 1960 and that at least five of those that survived cannot be accounted for. Thus it will be only too evident that from the summer of 1960 onwards London area records must be regarded with suspicion, although it will be noted that the two included above were both adults.

Lesser White-fronted Goose (*Anser erythropus*)

Gloucestershire: Slimbridge, three separate adults identified, 27th January-18th March, 11th February-19th March and 11th March (L. P. Alder, Hugh Boyd, M. Davy *et al.*).

Norfolk: Yare Valley, adult, 4th, 7th and 13th February (M. J. Scago).

Clackmannanshire: Cambus, adult, shot, 20th January (*per* T. Paterson).

Wigtownshire: The Merse, 27th March (D. Griffiths, Miss M. McKinna, D. Watson).

Snow Goose (*Anser caerulescens*)

Lanarkshire: Libberton, three Snow Geese—two of them blue phase Lesser Snow or "Blue Geese" (*A. c. caerulescens*)—were discovered one by one in a flock of Pink-footed Geese (*A. arvensis brachyrhynchus*) during the early months of 1960:

- (1) adult white phase, 4th March (probably from December 1959)-27th April (Sir Robert Erskine-Hill, Bt., A. T. Macmillan, W. K. Richmond *et al.*);
- (2) adult blue phase Lesser Snow, 8th March-25th April (Sir Robert Erskine-Hill, Bt., Miss R. S. Hunter, G. Waterston *et al.*); what was presumably the same bird was also present again from at least mid-October onwards (Sir Robert Erskine-Hill, Bt., Miss R. S. Hunter);
- (3) immature blue phase Lesser Snow, three occasions during the latter half of March (W. K. Richmond).

We should perhaps mention again that three birds (one white and two "blue") are known to have escaped from a collection near Dumfries in 1958 (*Brit. Birds*, 53: 162), while four Lesser Snow Geese wandered from Slimbridge about February 1957 and were never traced (*Brit. Birds*, 53: 416). Note, however, that the third bird above could not have been any of these.

[Red-breasted Goose (*Branta ruficollis*)

Dorset: Encombe, near Corfe Castle, adult, 17th-30th August (W. B. Alexander, I. A. F. Cooper, D. Newham *et al.*) and 21st September (A. M. Mackintosh)

There can be virtually no doubt that this was the bird which is known to have escaped from Bristol Zoo on 15th or 16th August 1960.

Goshawk (*Accipiter gentilis*)

(elsewhere than in the southern half of England)

Stirling: near Skinflats, upper Firth of Forth, immature ♀, 21st August (G. Dick, J. Potter).

Kite (*Milvus milvus*)

Norfolk: Cley, 8th April (W. F. Bishop).

Suffolk: Minsmere/Blythburgh, 3rd November (H. E. Axell, P. J. Makepeace *et al.*).

Sussex: Selsey Bill, 1st November (T. E. Brice, S. L. White *et al.*).

Gyr Falcon (*Falco rusticolus*)

Perthshire: Stuchd an Lochan, showing the characters of the Greenland race (*F. r. candicans*), 13th April (Mrs. D. Knipe, H. Knipe, W. K. Richmond).

Red-footed Falcon (*Falco vespertinus*)

Dorset: Hammoon, first-summer ♀, 16th-24th May (J. C. Follett, Mrs. A. Hughes *et al.*).

Hampshire: Farlington Marshes, first-summer ♂, 29th May (D. F. Billett, J. Simons, E. J. Wiseman).

Kent: near Deal, first-summer ♂, 6th July (D. F. Harle, Dr. A. Pettet).

Norfolk: Cley, ♀, 13th May (R. P. Cockbain, R. A. Richardson *et al.*).

Crane (*Megalornis grus*)

Norfolk: Brancaster, two, first-summer, 28th-29th April (R. Chestney, R. A. Richardson, C. M. Swaine *et al.*).

Yorkshire: Lissett, adult, 16th (probably 14th)-27th April (H. O. Bunce, C. H. Voase *et al.*).

Several other observations have been claimed, but the descriptions have contained insufficient detail for the specific identification to be certain. A wide variety of cranes are kept in European zoos and some inevitably escape: to give a recent example, five Demoiselle Cranes (*Anthropoides virgo*), with their wings partially clipped, were seen in flight over Cley (Norfolk) on 1st May 1960 (see *Brit. Birds*, 53: 279). Consequently, it behoves an observer confronted with an apparent European Crane to take down a detailed description in order that he—and we—can eliminate the possibility of some exotic species that has come from captivity.

Little Crake (*Porzana parva*)

Norfolk: Brinton, as reported on page 177, ♂, 15th November 1959 and on several subsequent dates to 14th January 1960.

Little Bustard (*Otis tetrax*)

Suffolk: Orfordness, 20th June (W. H. Payn).

Kentish Plover (*Charadrius alexandrinus*)

(elsewhere than on the coast from the Wash to Hampshire and the Isle of Wight)

Cambridgeshire/Norfolk: Ouse Washes, ♂, 18th April (M. T. Barnes, G. M. S. Easy *et al.*).

Devon: Dawlish Warren, ♂, 22nd May (L. I. Hamilton); Kingsbridge Estuary, 17th September (M. J. McVail).

Dorset: Ferrybridge, Portland, 2nd April (Miss M. D. Crosby, J. E. Lousley); 29th August (Miss M. D. Crosby).

Gloucestershire: Slimbridge, 4th April (Hugh Boyd, Dr. Janet Kcar).

Middlesex: Perry Oaks sewage-farm, ♀, 3rd April (L. A. Batten, S. Greenwood *et al.*).

Short-billed or Long-billed Dowitcher (*Limnodromus griseus* or *scolopaceus*)

East Lothian: Gullane Point, 29th September (A. Ablett, Mrs. Ablett).

Lanarkshire: Hamilton, 8th-12th October (M. Forrester, W. K. Richmond, D. Stalker).

A brief statement regarding the separation of the two species of dowitcher will be found in our 1958 report (*Brit. Birds*, 53: 164-165), but it is hoped to deal with the position more fully in this journal before next autumn.

Great Snipe (*Gallinago media*)

Northumberland: Holywell Ponds, 20th February (J. D. Parrack).

Fair Isle: 4th October (P. Davis, B. S. Milne *et al.*); also 19th October (B. S. Milne); possibly one individual.

Upland Sandpiper (*Bartramia longicauda*)

Pembrokeshire: Skokholm, 18th October (R. J. Dowsett, K. D. Smith *et al.*).

Common Sandpiper (*Tringa hypoleucos*)

Carmarthenshire: Whitland, showing the characters of the North American race (*T. b. macularia*) (which was formerly known as the Spotted Sandpiper and regarded as a separate species), 15th-18th May (E. L. Crouch, T. A. W. Davies, J. W. Donovan *et al.*).

White-rumped Sandpiper (*Calidris fuscicollis*)

Kent: Sandwich, 2nd October (Sir Frederick A. Hoare, H. C. Holme).

Pectoral Sandpiper (*Calidris melanotos*)

Anglesey: Malltraeth, immature, trapped, 11th September (R. P. Cockbain, C. J. Ellis, A. Jones *et al.*).

Caernarvonshire: Bardsey, two, 15th-17th September (R. W. Arthur, C. J. Mead, C. K. Mylne *et al.*).

Cheshire: Dee Estuary, 17th, 21st and 25th August (A. Baldrige); Halton Moss, trapped, 15th-18th October (R. P. Cockbain, C. J. Ellis, A. Jones *et al.*); the latter was originally reported as a Sharp-tailed Sandpiper (*C. acuminata*) (*Brit. Birds*, 53: 534).

Cornwall: Crowan Reservoir, 15th-17th September (Dr. G. Allsop, Rev. J. E. Beckerlegge, N. R. Phillips *et al.*).

Flintshire: Shotton, 31st July-13th August (A. Baldrige *et al.*).

Glamorgan: Kenfig Pool, 13th September (R. G. Knight).

Kent: Stoke sewage-farm, 24th-25th July (I. R. Beames); Walland Marsh, trapped, 24th August, released at Dungeness (C. J. Booth, R. E. Scott *et al.*).

Lincolnshire/Norfolk: Wisbech sewage-farm, 17th-18th September (M. Barry, J. L. Moore, D. Porter).

Middlesex: Perry Oaks sewage-farm, 29th-30th July (M. Coath, J. Cox *et al.*); 21st August (R. J. Johns, J. R. Puttock); 26th August-3rd September (P. R. Colston, P. A. D. Hollom, R. J. Johns *et al.*); almost certainly three different individuals.

Norfolk: Cley, 28th August (R. A. Richardson); one which arrived on 15th September was joined by a second bird on 19th September, the two remaining until 22nd September (C. Bentley, Mrs. Bentley, W. F. Bishop *et al.*); Salthouse, 2nd-8th October (W. F. Bishop, Major Aubrey Buxton, Major A. H. Daukes).

Isles of Scilly: Tresco, two, 23rd-24th August (L. A. Batten, A. D. Brewer, M. Coath *et al.*).

Stirling: near Grangemouth, 19th September (G. Dick, J. Potter).

More occurrences of this species were reported during 1960 than in any previous year.

Buff-breasted Sandpiper (*Tryngites subruficollis*)

Lancashire: Freckleton sewage-farm, 21st August-4th September (D. Hindle, H. Shorroek, D. R. Talbot *et al.*).

East Lothian: Gullane, 18th September (J. E. King).

Sutherland: Dornoch Point, 25th September (D. Macdonald).

Black-winged Stilt (*Himantopus himantopus*)

Dorset: Wareham sewage-farm, 3rd August-6th September (Miss H. Brotherton, J. C. Follett, P. Partington *et al.*).

Somerset: Porlock, 23rd July-8th August (Mrs. G. Chadwyck-Healey, H. H. Davis, M. A. Wright *et al.*).

Pratincole (*Glareola pratincola*)

Essex: Abberton Reservoir, with dark underwing, 28th August-14th September (G. C. Gore, C. F. Mann, Major-General C. B. Wainwright *et al.*).

Like the Northamptonshire individual of 1959 (*Brit. Birds*, 53: 419), but unlike the Essex one of 1958 (53: 166), the Abberton bird bore the characters of the Black-winged Pratincole (*G. nordmanni*). However, only one European species of pratincole is now recognised in this country, *nordmanni* being regarded as a colour phase of *pratincola* that is more or less dominant in south-east Europe and south-west Asia (*Ibis*, 98: 161).

The pratincoles previously mentioned in this journal (*Brit. Birds*, 53: 455) as having been imported during 1960 were subsequently found to have been obtained in Thailand. They were examples of the chestnut underwing phase of *G. pratincola*. There were two consignments totalling eight birds, all of which have been accounted for. We are grateful to M. D. England for investigating the position on our behalf.

Mediterranean Black-headed Gull (*Larus melanocephalus*)

Cornwall: St. Ives, immature, 10th March-10th April; and immature, 26th-27th November and 10th December (R. Khan, P. Pearce, N. R. Phillips *et al.*).

Dorset: Ferrybridge, Portland, sub-adult(s), 21st and 30th August and 11th and 15th September (K. V. Edwards, J. H. Morgan, D. A. Scott *et al.*); Portland Bill, sub-adult(s), 22nd and 29th August and 12th and 16th September (R. Burt, M. D. Smith, M. H. Terry *et al.*); from the descriptions submitted, it is possible that these eight observations involve two individuals.

Co. Durham: Hartlepool, as previously reported (*Brit. Birds*, 53: 419), adult, 9th August 1959-20th March 1960; also adult, 6th August-18th September (D. G. Bell, P. Reid, P. J. Stead *et al.*).

Essex: The Naze, adult, 20th August-6th October (J. Digby, G. A. Pyman, J. K. Weston *et al.*).

Hampshire: Eastney, adult, 6th, 13th and 15th March (M. E. Nolan, B. W. Renyard); Langstone Harbour, adult, 31st July; second-winter, 27th November (G. H. Rees).

Norfolk: Salthouse, first-winter, 18th September (D. K. Ballance, I. C. T. Nisbet); Winterton, second-winter, 24th-25th September (P. D. Kirby, M. J. Seago).

Suffolk: Lowestoft, as reported on page 177, adult, 11th October 1959-19th March 1960.

Sussex: Selsey Bill, immature, 13th April (P. J. Morgan, R. J. Olliver); immature, 11th May (M. A. Jennings, R. J. Sandison); adult, 30th July and 6th-7th August (R. J. F. Child, B. A. E. Marr, A. B. Sheldon *et al.*); adult, 16th-17th and 23rd October (S. F. Knight, M. H. Port, R. F. Porter *et al.*); Manhood End, immature, 16th April (A. B. Sheldon); Langney Point, first-summer, 16th June (D. D. Harber); Brighton, adult, 9th October (G. A. Sutton).

Yorkshire: Atwick, first-winter, 16th October (G. R. Bennett).

The Durham and Essex records involved what were presumably the same individuals for the fifth successive year in each case. While both have always arrived in the late summer, the Essex one habitually

has left in the autumn whereas, until now, the Durham bird has normally remained well into the following year.

Sabine's Gull (*Xema sabini*)

Anglesey: Llanddwyn Island, as previously reported (*Brit. Birds*, 53: 420), immature, 26th December 1959-4th January 1960.

Cornwall: St. Ives, four records of immature(s), 5th September (B. King); 16th September (B. King, P. Pearce, N. R. Phillips); 21st September (N. R. Phillips); 19th October (R. Khan, P. Pearce); offshore, near Wolf Rock, two immatures, 13th September (B. King, M. J. Mackmin, R. N. F. Simpson).

Devon: Dawlish Warren, 9th October (R. G. Adams, P. W. Ellicott *et al.*).

Dorset: Portland Bill, twelve separate observations of single birds, 9th-22nd October, involving at least two individuals and probably six or even more (Dr. J. S. Ash, Miss S. M. Butlin, J. A. Wigzell *et al.*).

Co. Durham: Teesmouth, sub-adult, 24th July (J. A. Bailey, D. G. Bell, P. J. Stead *et al.*); Hartlepool, sub-adult, 2nd August (K. Baldridge, R. T. McAndrew, R. A. McKinley); almost certainly one individual.

Hampshire: Eastney, immature, 4th December (B. E. Cooper, M. E. Nolan, A. Quinn).

Norfolk: Cley, adult, 3rd August (R. G. Hawley).

Ross's Gull (*Rhodostethia rosea*)

Northumberland: Holywell Ponds, freshly dead adult ♂, 30th April; now preserved in the Hancock Museum, Newcastle upon Tyne (*Brit. Birds*, 53: 444-445).

White-winged Black Tern (*Chlidonias leucopterus*)

Essex: Parkeston, adult, 13th May (W. E. Richardson); Hanningfield Reservoir, adult, 20th May (Miss G. M. Crofts, Miss S. R. Crofts); Abberton Reservoir, 19th August (Miss D. R. Crofts, Miss S. R. Crofts *et al.*).

Gloucestershire: between Purton and Frampton, adult, 27th August (L. P. Alder).

Hampshire: Lee-on-Solent, adult, 11th May (D. Price).

Sussex: Selsey Bill, adult, 27th April (R. L. K. Jolliffe, N. Money, R. F. Porter); Langney Point, immature, 23rd September (D. D. Harber).

A paper by K. Williamson on the juvenile and winter plumages of the marsh terns, with sketches by D. I. M. Wallace, was specially prepared at our request and published last year in this journal (*Brit. Birds*, 53: 245-252, plate 36).

Gull-billed Tern (*Gelochelidon nilotica*)

Kent: near Deal, 10th June (Dr. A. Pettet); Reculver, 11th-16th June (E. H. Gillham, J. Hewett, R. G. Pitt *et al.*); Shellness, Sheppey, 1st October (J. N. Hori); Dungeness, three, 19th June (B. A. E. Marr); 17th September (D. I. M. Wallace, Mrs. K. Wallace).

Sussex: Selsey Bill, 23rd April (M. A. Jennings, R. L. K. Jolliffe, R. F. Porter); 1st May (B. A. E. Marr, N. Money, A. B. Sheldon); 4th May (A. B. Sheldon); 9th May (M. A. Jennings); 14th May (M. A. Jennings, B. A. E. Marr, A. B. Sheldon); 15th May (M. A. Jennings, B. A. E. Marr, M. Shrubb); 3rd July

(B. A. L. Marr); two, 16th July (B. A. E. Marr); 24th August (P. R. Mills); Langney Point, 2nd July (D. D. Harber).

East Lothian: Aberlady Bay, 11th September (T. C. Smout).

The possibility that the majority of the Sussex records relate to one individual obviously cannot be ruled out, but it is perhaps significant that on all occasions save the last two, the direction of flight was up-Channel.

Caspian Tern (*Hydroprogne caspia*)

Suffolk: Benacre gravel-pits, 21st July (F. E. Muddeman, N. Muddeman).

Sussex: Selsey Bill, 6th May (A. B. Sheldon).

Brünnich's Guillemot (*Uria lomvia*)

Lancashire: Middleton Sands, near Morecambe, dead, 15th April (K. E. Hague, M. T. Rigby) (full details to be published).

Rufous Turtle Dove (*Streptopelia orientalis*)

Isles of Scilly: St. Agnes, 2nd-3rd and 6th May (*Brit. Birds*, 53: 445-446).

Great Spotted Cuckoo (*Clamator glandarius*)

Anglesey: Newborough, 3rd-15th April (*Brit. Birds*, 53: 358).

Yellow-billed Cuckoo (*Coccyzus americanus*)

Sussex: Middleton-on-Sea, adult ♀, comparatively freshly dead, 14th December (Major W. W. A. Phillips, L. D. Smith, E. M. Venables); now preserved in Bognor Regis Museum.

Snowy Owl (*Nyctea scandiaca*)

Kincardineshire: Cairn O'Mount, 3rd March (A. S. Temple).

Alpine Swift (*Apus melba*)

Anglesey: South Stack, near Holyhead, 8th October (R. G. O. Stephenson).

Norfolk: Breydon Water, 12th May (M. J. Seago).

Somerset: Portishead, 2nd October (W. Holmes).

Yorkshire: Eecup Reservoir, 4th June (G. Reynolds, F. C. Sterne).

Bee-eater (*Merops apiaster*)

Essex: Stanford-le-Hope, two, 20th April (J. E. Flynn).

Norfolk: Cley, 21st April (R. A. Richardson); Blakeney/Morston, two, 21st-26th April (W. F. Bishop, H. Hunt *et al.*) and one, 2nd May (H. Hunt).

Roller (*Coracias garrulus*)

Norfolk: Acle, 4th June (R. H. Harrison).

Suffolk: between Snape and Sudbourne, 6th-18th June (Mrs. C. M. Goodman, R. J. Partridge *et al.*).

Short-toed Lark (*Calandrella cinerea*)

Middlesex: Staines Moor, 8th-16th June (J. Cox, R. J. Johns, M. Nobbs *et al.*).

Fair Isle: 14th-15th May (G. J. Barnes, P. Davis *et al.*); 1st-10th October (P. Davis, B. S. Milne *et al.*); 9th-11th, 15th and 22nd October (G. J. Barnes, P. Davis, B. S. Milne), possibly three different individuals; 28th November-at least 6th December (P. Davis).

Of the Fair Isle occurrences, the May individual and also the first of the October birds were of the reddish southern type, as represented by the races *rubiginosa*, *hermonensis* and *brachyductyla*; while the remainder were of the greyish eastern type (*artemesia* or *longipennis*) (see also *Brit. Birds*, 48: 457-458, and *I.I.B.O. Bull.*, 2: 197-199).

Red-rumped Swallow (*Hirundo daurica*)

Kent: Yalding gravel-pits, 21st May (*Brit. Birds*, 53: 574-575).

Bearded Tit (*Parnus biarmicus*)
(elsewhere than in East Anglia)

Essex: Walthamstow Reservoirs, up to 15 (seven adult ♂♂), 16th October 1960-at least end of January 1961 (P. R. Colston, J. Fitzpatrick, R. F. Sanderson *et al.*); R. Stort valley, records of up to eight (four ringed) on Bishop's Stortford sewage-farm from 4th November to the end of the year (A. Darlington, R. J. Dowsett, S. E. Linsell) and of one to two seen and others heard at Stansted sewage-farm on several dates in November and December (A. Darlington, R. J. Dowsett) are thought to refer to the same birds.

Hampshire: Titchfield Haven, three (one ♂), 15th-16th January (Dr. C. Suffern, M. H. Terry *et al.*); up to three (two ♂♂), 14th February-3rd April (T. E. Brice, B. A. Heath, Dr. C. Suffern *et al.*).

Hertfordshire: Marsworth Reservoir, as previously reported (see *Brit. Birds*, 53: 422, and correction on page 178 above), at least two of the four birds first noted in November 1959 remained until 13th March 1960; the last report of four was actually on 30th January (Miss P. Hager); Broxbourne sewage-farm, 12th November (T. W. Gladwin); Wilstone Reservoir, four, 13th November (G. Wood); Stanborough, near Hatfield, six on 30th November and two on 1st December (G. King).

Kent: Gravesend/Northfleet, as reported on page 178, ♂, 13th December 1959-3rd January 1960; Swanseombe Marshes, five (two ♂♂), 30th October (Mrs. W. I. Brewer) and, all trapped, from 20th November until at least the end of the year, two or three remaining until 21st January 1961 (M. J. Carter, M. J. Cowlard, I. G. Sanders *et al.*).

Lincolnshire: Walesby, two (one ♂), 7th March (J. Lawson); Gibraltar Point, ♂, 15th April (M. C. Gray); Crowland Wash, ♀, 12th November (E. J. Redshaw).

Middlesex: Perry Oaks sewage-farm, adult ♂, trapped, 26th November 1960-at least 19th February 1961 (P. R. Colston, R. E. Emmett *et al.*).

Oxfordshire: Cassington gravel-pits, as previously reported (*Brit. Birds*, 53: 422), one of the three birds first noted on 28th November 1959 remained until March 1960.

Shropshire: (locality suppressed), two (one ♂), possibly more, 9th, 15th and 16th January (T. Forni, F. C. Gribble, Miss E. J. Peele *et al.*).

Sussex: Pett Level, three (one ♂) on 6th and two on 13th November (D. Elphick, W. J. Vinall).

Yorkshire: four in one area on 6th April; up to five in another locality on several dates during the year (*per* Yorkshire Naturalists' Union Records Committee).

In the autumn of 1959, following an eruption of the Norfolk and Suffolk populations, parties of Bearded Tits were noted at considerable distances from East Anglia (*Brit. Birds*, 53: 422-423). As can be seen from the above list, a number of further occurrences were reported during the early part of 1960, and several Bearded Tits spent the summer at one place in Yorkshire. After another successful breeding season in 1960, the East Anglian population was again unusually high and for the second successive autumn the birds were very restless. This was noted particularly at Minsmere (Suffolk) where H. E. Axell witnessed the actual departure of three small groups on 6th October (*Brit. Birds*, 54: 46). Subsequent reports of the species outside East Anglia are given above. It seems evident that the distances covered were less spectacular than in 1959-60, although for a species which is normally a rare vagrant outside its restricted breeding area the list of occurrences is still highly impressive. In addition to these, there were records in a number of localities in north-east, east and south-east Essex from October onwards.

Dusky Thrush (*Turdus eunomus*)

Co. Durham: Hartlepool, as previously reported (*Brit. Birds*, 53: 275-276 and 423, plate 35), first-winter ♂, 12th December 1959-24th February 1960.

Desert Wheatear (*Oenanthe deserti*)

Sussex: Selsey Bill, ♀, 28th October-8th November (D. D. Harber, B. A. E. Marr, G. A. Sutton *et al.*).

Red-flanked Bluetail (*Tarsiger cyanurus*)

Northumberland: Hartley, ♀ or first-winter ♂, 16th October (*Brit. Birds*, 54: 73).

This was recorded as a female, but young males are similar.

Lanceolated Warbler (*Locustella lanceolata*)

Fair Isle: 30th September and (trapped) 4th October; 1st November (unringed) (*Brit. Birds*, 54: 142-145).

Savi's Warbler (*Locustella luscinioides*)

Somerset: Chew Valley Reservoir, 24th and 30th July (B. King, K. Young).

Great Reed Warbler (*Acrocephalus arundinaceus*)

Berkshire: Thatcham, 1st-2nd June (L. R. Lewis, P. D. Mann).

Cornwall: Par Beach, 29th May-7th June (Dr. G. Allsop, C. J. Stevens, T. R. J. Williams).

Hampshire: Titchfield Haven, 18th-24th May (A. Y. Norris, Dr. C. Suffern, S. L. White *et al.*).

Kent: Stodmarsh, 30th-31st May (R. G. Pitt).

Sussex: Selsey Bill, 16th May (M. Shrubbs).

Save in the case of the Titchfield Haven bird (the recorded song of which was analysed by Eric Simms), the descriptions do not rule out the Clamorous Great Reed Warbler (*A. stentoreus*) of southern Asia and Egypt, especially the less rufous race *brunnescens*. As previously pointed out (*Brit. Birds*, 53: 168 and 423), the existence of other brown and buff warblers of comparable size—notably the Thick-billed Warbler (*Phragmaticola aëdon*) and Gray's Grasshopper Warbler (*Locustella fasciolata*)—must also be borne in mind in the identification of this species.

Marsh Warbler (*Acrocephalus palustris*)

(elsewhere than in England)

Fair Isle: trapped, 8th June (G. J. Barnes, P. Davis, Lt.-Col. H. G. Brownlow).

Aquatic Warbler (*Acrocephalus paludicola*)

Devon: Slapton Ley, 6th November (M. J. McVail); a notably late date.

Hampshire: Titchfield Haven, 25th September (M. Bryant, B. A. Heath, Dr. C. Suffern *et al.*).

Hertfordshire: Hilfield Park Reservoir, 14th-15th August (T. W. Gladwin, B. L. Sage, M. Vaughan).

Kent: Dungeness, 18th September (D. I. M. Wallace, Mrs. K. Wallace, S. Cramp *et al.*).

Isles of Scilly: St. Agnes, first-winter, trapped, 9th October (K. H. Hyatt, N. R. Phillips, E. G. Philp *et al.*).

Fair Isle: first-winter, trapped, 14th and 18th September (P. Davis, R. H. Dennis *et al.*).

Fife: Isle of May, trapped, 27th August (J. M. S. Arnott, M. J. McVail *et al.*); 19th September (F. D. Hamilton, J. Hoy, A. J. H. Wedderburn *et al.*).

Melodious Warbler (*Hippolais polyglotta*)

Caernarvonshire: Bardsey, trapped, 17th August (R. W. Arthur, R. H. S. McColl, P. J. Straw *et al.*); the same or another bird, 24th August (R. W. Arthur); one trapped on 28th August was retrapped on 1st September and what was presumably the same (ringed) bird was seen again on 5th and 7th September (R. W. Arthur *et al.*).

Dorset: Portland Bill, first-winter, 27th August (trapped 28th, retrapped 31st)—4th September (Dr. J. S. Ash, R. J. Jackson, K. Standring *et al.*); first-winter, trapped, 12th September (M. J. Carter, D. C. Mole, Dr. D. J. Godfrey *et al.*); first-winter, trapped, 18th September (Dr. A. B. Watson, R. Chainey, Dr. J. S. Ash *et al.*); 24th-25th September (Dr. J. S. Ash, D. C. Mole, Dr. A. B. Watson).

Kent: Dungeness, first-winter, trapped, 9th September (C. J. Booth, R. E. Scott *et al.*).

Pembrokeshire: Skokholm, trapped, 23rd May; another trapped, 3rd June; adult, trapped, 2nd September; adult, trapped, 13th September (K. D. Smith).

Icterine Warbler (*Hippolais icterina*)

Caernarvonshire: Bardsey, 26th-27th August (R. W. Arthur, B. D. Bell, D. A. Rowlands *et al.*).

Dorset: Portland Bill, trapped, 4th September (Dr. J. S. Ash, B. W. Edwards, D. A. Scott *et al.*); another trapped, 6th September (D. E. Fry, A. J. Horner, E. Williams *et al.*); Rowe Holt, two, 7th September (Miss V. Goodwin).

Kent: Dungeness, trapped, 21st May (H. A. R. Cawkell, G. J. Harris, R. E. Scott *et al.*); trapped, 16th-18th September (H. A. R. Cawkell, R. E. Scott, L. P. Tucker *et al.*).

Lincolnshire: Gibraltar Point, trapped, 26th September (W. M. Peet *et al.*).

Norfolk: Scolt Head, ♂ trapped, 20th May (R. Chestney, Miss J. M. Ferricr, R. A. Richardson); Blakeney Point, immature, trapped, 6th-7th August (P. R. Clarke, R. A. Richardson, P. H. G. Wolstenholme); Holme-next-the-Sea, 11th September (G. M. S. Easy, C. A. E. Kirtland); Cley, 12th September (R. A. Richardson, D. Wooldridge); Holkham, 23rd September (R. J. Johns).

Fair Isle: trapped, 25th August; another trapped, 1st September (G. J. Barnes, P. Davis *et al.*).

Fife: Isle of May, two, first-winter, trapped, 29th August, one remaining until 31st and the other until 1st September (J. M. S. Arnott, C. L. Hill *et al.*).

Melodious or Icterine Warbler (*Hippolais polyglotta* or *icterina*)

Birds which were of one or the other of these two species were reported from Louth (Lincolnshire) on 28th August (C. L. Ottaway); Portland Bill (Dorset) on 30th-31st August (B. W. Edwards, N. Money); Bradwell (Essex) on 9th September (F. R. Trevett); and near Blyth (Northumberland) on 18th September (M. Bell).

Our reasons for the publication of these indeterminate records were given in the 1958 report (*Brit. Birds*, 53: 153 and 169).

Subalpine Warbler (*Sylvia cantillans*)

Norfolk: Blakeney Point, first-summer ♂, trapped, 22nd-23rd May (P. R. Clarke, P. D. Kirby, R. A. Richardson).

Greenish Warbler (*Phylloscopus trochiloides*)

Pembrokeshire: Skokholm, ♀, trapped, 31st August (G. Burrows, I. R. Downhill, K. D. Smith *et al.*).

Yorkshire: Spurn Head, adult, trapped, 4th-5th June (P. J. Mountford, R. Parrish, R. Simms *et al.*); trapped, 4th September (J. Cudworth, J. K. Fenton, P. J. Mountford *et al.*).

Fair Isle: first-winter, showing the characters of *Pb. t. viridanus*, trapped, 7th-9th September (G. J. Barnes, P. Davis, K. Williamson).



PLATE 27. Turtle Dove (*Streptopelia turtur*), Suffolk, July 1960 (John Markham) (page 200)



PLATE 28. Above, Herring Gulls (*Larus argentatus*), Cumberland, June 1960 (B. Garth)
Below, Great Crested Grebes (*Podiceps cristatus*), Norfolk, June 1960 (Arthur Gilpin)



PLATE 29A
Heron
(*Ardea cinerea*)
Norfolk
October 1959
(G. des Forges)



PLATE 29B
Fulmar
(*Fulmarus glacialis*)
Northumberland
June 1960
(Dennis W. Hatton)



PLATE 30. Male Bearded Tit (*Pamurus biarmicus*), Norfolk, May 1960 (Harold R. Loves)



PLATE 31. Above, juvenile Red-necked Phalarope (*Phalaropus lobatus*), Norfolk, August 1959 (C. C. Doncaster). Below, Curlews (*Numenius arquata*) and Oystercatchers (*Haematopus ostralegus*), Cheshire, September 1959 (Roger Warburst)





PLATE 32A
Common Sandpiper
(*Tringa hypoleucos*)
Sutherland
June 1960
(D. A. P. Cooke)



PLATE 32B
Gull-billed Tern
(*Gelochelidon nilotica*)
Denmark
June 1959
(Guy B. Farrar)



PLATE 33. Whitethroat (*Sylvia communis*), Yorkshire, June 1959 (Morley Hedley)



PLATE 34. Woodpigeons (*Columba palumbus*), Cambridgeshire, August 1960 (R. K. Murton)
This photograph shows an interesting display which is mostly to be seen before the eggs are laid. In this case the male Woodpigeon (sitting) had been "nest calling" on an empty nest when the female arrived and started preening his head and neck as shown. He continued to give the nest call and the female also occasionally uttered a much lower version of it. This behaviour was followed by nest building

Arctic Warbler (*Phylloscopus borealis*)

Isles of Scilly: St. Agnes, trapped, 10th October (K. H. Hyatt, E. G. Philp, E. C. Still).

Fair Isle: 21st September (P. Devillers, C. Waller).

Yellow-browed Warbler (*Phylloscopus inornatus*)

Caernarvonshire: Bardsey, trapped, 26th September (R. W. Arthur, P. J. Straw).

Cornwall: Landewednack, The Lizard, 16th and 23rd October (Dr. G. Allsop, A. G. Parsons *et al.*).

Dorset: Portland Bill, one, subsequently identified by Dr. J. M. Harrison as first-winter ♀ *Ph. i. inornatus*, trapped 30th September, died 1st October (J. H. Brock, A. M. Clark, R. F. Thearle *et al.*).

Kent: Sandwich, 11th October (D. F. Harle).

Lincolnshire: Gibraltar Point, trapped, 28th September (W. M. Peet *et al.*).

Surrey: Reigate, 28th September (Mrs. J. Cordero).

Yorkshire: Spurn Head, trapped, 27th-30th September (Col. H. G. Brownlow, J. H. O. Leach, P. J. Mountford); 14th October (Col. H. G. Brownlow); another trapped, 30th October (R. F. Dickens, P. J. Mountford, C. Winn *et al.*).

Fair Isle: at least 11 different birds—one trapped, 22nd-23rd September; six (two trapped), 27th September; six (one trapped), including one to two "new" arrivals, 28th September, two remaining until 30th; one on 2nd October may have been one of these or a fresh arrival; another, 6th-7th October; two, 15th October, one remaining until 18th (G. J. Barnes, P. Davis *et al.*).

Fife: Isle of May, trapped, 28th-29th September (D. R. Grant, A. E. Macdonald).

Pallas's Warbler (*Phylloscopus proregulus*)

Essex: The Naze, 16th October (*Brit. Birds*, 54: 73-74).

Yorkshire: Spurn Head, 22nd-23rd October (Lt.-Col. H. G. Brownlow, J. M. Butterworth, P. H. G. Wolstenholme *et al.*) (full details to be published).

Firecrest (*Regulus ignicapillus*)

(Scotland only)

Fife: Isle of May, 22nd September (W. S. Medlicott, Mrs. Medlicott).

This is only the second fully authenticated Scottish record.

Richard's Pipit (*Anthus noraeaeelandiae*)

Anglesey: Llanddwyn Island, 14th November (P. Hopc Jones).

Kent: Allhallows, 23rd April (P. C. Bance).

Somerset: Brean Down, 16th October (E. G. Holt).

Yorkshire: Atwick, 22nd October (G. R. Bennett).

Fair Isle: 21st-23rd October (G. J. Barnes, P. Davis, B. S. Milne).

Tawny Pipit (*Anthus campestris*)

Dorset: Portland Bill, two, 11th September (Dr. J. S. Ash, M. J. Carter, B. Newport).

Essex: Frinton-on-Sea, 13th September (R. V. A. Marshall).

Kent: Reculver, 24th September (J. Hewett, R. G. Pitt).

Norfolk: Salthouse, 15th-18th May (R. A. Richardson, M. J. Seago, R. D. Wilson *et al.*); Hunstanton, 26th September (G. M. S. Easy).

Suffolk: Havergate Island, 4th August (D. G. Gordon-Smith); Covehithe, 6th September (J. W. Andrews, R. V. A. Marshall).

Sussex: Langney Point, at least four different birds—17th September (D. D. Harber); two, 18th September (R. H. Charlwood); three, 19th September (R. H. Charlwood); 25th and 27th September (R. H. Charlwood, D. D. Harber); Selsey Bill, 17th September; three, 18th September (B. A. E. Marr, A. B. Sheldon *et al.*).

Yorkshire: Spurn Head, 1st May (R. Chislett, J. Cudworth, P. J. Mountford *et al.*).

Red-throated Pipit (*Anthus cervinus*)

Fair Isle: at least one, probably two, 16th September (G. J. Barnes, P. Davis, R. H. Dennis *et al.*); trapped, 2nd-10th October (G. J. Barnes, P. Davis, B. S. Milne *et al.*); 22nd-27th October (G. J. Barnes, P. Davis, B. S. Milne).

Yellow-headed Wagtail (*Motacilla citreola*)

Fair Isle: first-winter, 17th-22nd October (*Brit. Birds*, 54: 125-126).

Lesser Grey Shrike (*Lanius minor*)

Co. Durham: Tinsdale sewage-farm, first-winter, 24th October (E. Shearer).

Lincolnshire: Gibraltar Point, immature, 11th October (N. J. P. Wadley).

Fair Isle: 5th June (G. J. Barnes, Col. H. G. Brownlow, P. Davis *et al.*).

Woodchat Shrike (*Lanius senator*)

Caernarvonshire: Bardsey, 5th-6th June (R. W. Arthur, P. J. Straw, M. R. Wilson).

Essex: Mucking, adult ♂, 24th May (B. Kemp).

Lincolnshire: Gibraltar Point, adult, 7th June (D. Hill).

Norfolk: Salthouse Heath, adult ♂, 16th-17th May (D. Bryant, R. A. Richardson, E. C. J. Swabey *et al.*); Blakeney Point, first-summer ♂, 20th-22nd May (M. Goodman, P. D. Kirby, R. A. Richardson *et al.*); Cley, first-summer, 26th May (G. M. S. Easy, Miss J. M. Ferrier, R. A. Richardson *et al.*); Thornham, ♂, 26th May (M. T. Barnes, G. M. S. Easy).

Pembrokeshire: Newport, adult, lying stunned on a window sill and examined in the hand, 17th August (Miss L. C. Glover).

Isles of Scilly: Treseo, 12th May (D. A. Todd, Mrs. Todd); St. Agnes, 29th-30th May (Miss H. M. Quick); immature, trapped, 14th August (A. D. Brewer, M. J. Mackmin, B. E. Madagan *et al.*); another immature, trapped, 21st August (J. Bevan, A. D. Brewer, R. C. Righelato *et al.*); immature, 10th-11th September (P. R. Colston, R. E. Emmett, R. N. F. Simpson *et al.*); Bryher, immature, 23rd and 25th August (T. B. Silcocks, Mrs. M. A. Silcocks).

Surrey: Addington, adult ♂, 13th May (D. Shepherd, R. N. F. Simpson *et al.*).

Fair Isle: ♂, 12th-15th May (G. J. Barnes, P. Davis *et al.*); immature, trapped, 29th August-1st September (G. J. Barnes, P. Davis, R. H. Dennis *et al.*).

The comparatively large influx of Woodchat Shrikes was one of the features of the spring migration.

Red-tailed Shrike (*Lanius cristatus*)

Fair Isle: adult ♂, trapped, showing the characters of *phoenicuroides*, one of the *isabellinus* group of central Asia, known as the Red-tailed or Isabelline Shrikes, 12th-13th May *Brit. Birds*, 54: 209-210).

The *isabellinus* shrikes were discussed at some length in our last report (*Brit. Birds*, 427-428). Very briefly, this group is now generally regarded as conspecific with the Red-backed Shrikes (*collurio*), while some authorities unite both with the Brown Shrikes (*cristatus*). It is thus that they were treated by the B.O.U. Taxonomic Committee in its recommendations in 1956 (*Ibis*, 98: 167) and, as it is our policy to follow the decisions of that committee, we are referring the Fair Isle bird (as well as the two previously recorded in this country) to *Lanius cristatus*.

Myrtle Warbler (*Dendroica coronata*)

Devon: Lundy, trapped, 5th-14th November (F. W. Gade, L. G. Lyall, W. B. Workman *et al.*) (full details to be published).

Rose-coloured Starling (*Sturnus roseus*)

[**Glamorgan:** West Cross, Swansea, adult, 29th July and several subsequent dates to 18th August (*per* H. Dickinson).]

[**Suffolk:** Lowestoft, ♂, 13th-18th May (R. W. Coleman, R. A. Richardson *et al.*).]

Fair Isle: adult, 12th-13th August (G. J. Barnes, P. Davis, A. Duncan *et al.*).

Shetland: Foula, moribund adult ♀, 13th August (Mrs. J. A. Gear); now preserved in the Royal Scottish Museum.

As mentioned on page 178, Rose-coloured Starlings are regularly imported in captivity. Indeed, the scale of importation appears to be increasing and occurrences of the species may well eventually pose an even greater problem than those of the Red-headed Bunting (see page 196) since the present species is perhaps more likely to arrive in these islands of its own volition.

In view of its faded plumage, tameness and unusual feeding habits, the Lowestoft bird was regarded by the observers as an almost certain escape and we have accordingly placed the record in square brackets. The Swansea individual, which we have treated similarly, was seen in a number of suburban gardens where it took bread which had been put out for the resident birds.

Serin (*Serinus canarius*)

Dorset: Portland Bill, 12th November (Dr. J. S. Ash, R. Chainey, C. Stevens).

Scarlet Grosbeak (*Carpodacus erythrinus*)

Caernarvonshire: Bardsey, trapped, 25th August (R. W. Arthur, D. L. Clugston, R. Eade *et al.*).

Yorkshire: Spurn Head, trapped, 1st October (J. R. Mather, R. C. Parkinson, G. R. Wilkinson *et al.*).

Fair Isle: at least five, possibly seven, different birds—one, 4th September; two trapped, 5th-10th September; two (one trapped, the other possibly one of the birds previously recorded), 12th September; one (unringed), 15th-18th September; another, 22nd September; one, 25th-28th September, may have been the individual seen on the 22nd (G. J. Barnes, P. Davis, K. Williamson *et al.*).

Fife: Isle of May, ♀, trapped, 1st-28th September (J. M. S. Arnott, J. I. Martin, M. J. McVail *et al.*).

As pointed out in our last report (*Brit. Birds*, 53: 428), Scarlet Grosbeaks are imported from India every year and sold in this country as Rose Finches. However, there is little doubt that the above records, all of female or immature birds, refer to genuine vagrants, since the species has long been known as a regular autumn wanderer to Britain, particularly in September and especially on Fair Isle and, to a lesser extent, the Isle of May.

Red-headed Bunting (*Emberiza bruniceps*)

Dorset: Portland Bill, adult ♂, 19th, 22nd and 23rd September (A. J. Bull, Miss M. D. Crosby, E. H. Lousley).

Kent: Dungeness, adult ♂, 15th May (P. J. Grant); [Gillingham, adult ♂, 21st August (D. F. Musson)].

Norfolk: Cley, adult ♂, 5th June (W. F. Bishop, P. New, S. Jones).

Northumberland: adult ♂, near New Hartley, 15th-17th June (F. G. Grey, M. G. Robinson *et al.*).

Fair Isle: ♂, 8th-13th August (G. J. Barnes, P. Davis, A. Duncan *et al.*).

Fife: Isle of May, ♂, 28th-29th August (J. M. S. Arnott, M. J. McVail *et al.*).

Once again it must be stressed that Red-headed Buntings, most of them males, are now imported as cage-birds into Britain and other western European countries in enormous numbers each year, so that there can be little doubt that the great majority, if not all, of the substantial number of records of *bruniceps* at large refer to ones that have escaped. Indeed, the behaviour of the Gillingham bird showed that it was almost certainly an escape. It should be added, however, that from the excellent state of its plumage and the brightness of its head coloration, the Cley bird either was wild or had been at large for a considerable period.

Rustic Bunting (*Emberiza rustica*)

Isles of Scilly: St. Agnes, ♂, 7th October (K. H. Hyatt, N. R. Phillips, E. C. Still *et al.*).

Fair Isle: at least two different individuals, 22nd-23rd and 27th September (G. J. Barnes, P. Davis *et al.*).

Fife: Isle of May: adult ♂, trapped, 29th September-2nd October (D. R. Grant, A. F. Macdonald).

Little Bunting (*Emberiza pusilla*)

Hertfordshire: Hilfield Park Reservoir, 20th April (B. L. Sage).

Norfolk: Cley, ♂, 1st October (Eric Simms).

Fair Isle: 13th May (G. J. Barnes); trapped, 7th-10th September (G. J. Barnes, P. Davis, K. Williamson *et al.*); first-winter ♂, 14th September, found dead on 15th (G. J. Barnes, P. Davis, R. H. Dennis *et al.*); two, 27th September, one remaining until 30th; another (or perhaps the bird of 27th-30th September), 2nd October (G. J. Barnes, P. Davis, H. A. Craw *et al.*); trapped, 14th-16th October (G. J. Barnes, P. Davis, B. S. Milne).

APPENDIX I—FULL LIST OF SPECIES WHICH COME UNDER
THE CONSIDERATION OF THE RARITY RECORDS COMMITTEE

*This list is based on the British and Irish list and includes five species which are still under consideration for that; it is perhaps hardly necessary to add that we are also interested in records of birds which are not as yet on the British and Irish list at all. In addition, we are concerned with certain well-marked races, such as Green-winged Teal, Spotted Sandpiper, Black-headed Wagtail and Isabelline Shrike.

White-billed Diver	Baikal Teal	Black Kite
Black-browed Albatross	Blue-winged Teal	White-tailed Eagle
Wilson's Petrel	American Wigeon	Pallid Harrier
Madeiran Petrel	*Red-crested Pochard	Gyr Falcon
Frigate Petrel	(outside London area)	Red-footed Falcon
Little Shearwater	Ring-necked Duck	Lesser Kestrel
Audubon's Shearwater	Ferruginous Duck	Crane
Cory's Shearwater	Buffelhead	Sora Rail
Bulwer's Petrel	Surf Scoter	Baillon's Crake
Kermadec Petrel	Harlequin	Little Crake
Collared Petrel	Steller's Eider	American Purple
Capped Petrel	King Eider	Gallinule
Magnificent Frigate-	Hooded Merganser	Great Bustard
bird	Ruddy Shelduck	Little Bustard
Purple Heron	Lesser White-fronted	Houbara Bustard
Little Egret	Goose	Sociable Plover
Great White Heron	Snow Goose	Kentish Plover (except
Squacco Heron	Red-breasted Goose	coast from Wash to
Cattle Egret	Egyptian Vulture	Hampshire and Isle
Night Heron	Griffon Vulture	of Wight)
Little Bittern	Golden Eagle (south	Killdeer
American Bittern	of 54°N)	Caspian Plover
White Stork	Spotted Eagle	Asiatic/American
Black Stork	Goshawk (outside	Golden Plover
Glossy Ibis	southern half of	Short-billed Dowitcher
Flamingo	England)	Long-billed Dowitcher
Black Duck	Kite (outside Wales)	Great Snipe

*From the beginning of 1961, records of species so marked are being accepted for publication on the recommendation of the local organisation concerned.

Upland Sandpiper	Nighthawk	Booted Warbler
Eskimo Curlew	Red-necked Nightjar	Orphean Warbler
Solitary Sandpiper	Egyptian Nightjar	Sardinian Warbler
Greater Yellowlegs	Alpine Swift	Subalpine Warbler
Lesser Yellowlegs	Needle-tailed Swift	Dartford Warbler
Marsh Sandpiper	Bee-eater	(outside England)
Terek Sandpiper	Blue-cheeked Bee-eater	Rufous Warbler
Least Sandpiper	Roller	Greenish Warbler
Baird's Sandpiper	Calandra Lark	Bonelli's Warbler
White-rumped Sand- piper	White-winged Lark	Arctic Warbler
Pectoral Sandpiper	Short-toed Lark	Yellow-browed Warbler
Sharp-tailed Sandpiper	Lesser Short-toed Lark	Pallas's Warbler
Semipalmated Sandpiper	Crested Lark	Dusky Warbler
Western Sandpiper	Red-rumped Swallow	Radde's Bush Warbler
Buff-breasted Sandpiper	Nutcracker	Firecrest (Scotland only)
Broad-billed Sandpiper	Crested Tit (outside Scotland)	Brown Flycatcher
Black-winged Stilt	*Bearded Tit (outside East Anglia)	Collared Flycatcher
Stilt Sandpiper	Wallcreeper	Alpine Accentor
Wilson's Phalarope	Dusky Thrush	Alpine Pipit
Pratincole	Black-throated Thrush	Tawny Pipit
Cream-coloured Courser	Siberian Thrush	Pechora Pipit
Ivory Gull	American Robin	Red-throated Pipit
Great Black-headed Gull	White's Thrush	Yellow-headed Wagtail
Mediterranean Black- headed Gull	Rock Thrush	Lesser Grey Shrike
Bonaparte's Gull	Olive-backed Thrush	Woodchat Shrike
Sabine's Gull	Grey-checked Thrush	Red-eyed Vireo
Ross's Gull	Desert Wheatear	Black-and-White Warbler
White-winged Black Tern	Black-eared Wheatear	Myrtle Warbler
Whiskered Tern	Pied Wheatear	Northern Waterthrush
Gull-billed Tern	Isabelline Wheatear	Yellowthroat
Caspian Tern	Black Wheatear	Rose-coloured Starling
Sooty Tern	Red-flanked Bluetail	Summer Tanager
Bridled Tern	Thrush Nightingale	Baltimore Oriole
Royal Tern	Cetti's Warbler	Rose-breasted Grosbeak
Brünnich's Guillemot	Lanceolated Warbler	Arctic Redpoll
Pallas's Sandgrouse	Savi's Warbler	Citrel Finch
Eastern Turtle Dove	Pallas's Grasshopper Warbler	Serin
Great Spotted Cuckoo	Moustached Warbler	Scarlet Grosbeak
Yellow-billed Cuckoo	Thick-billed Warbler	Pine Grosbeak
Black-billed Cuckoo	Great Reed Warbler	Two-barred Crossbill
Scops Owl	Marsh Warbler (outside England)	White-throated Sparrow
Eagle Owl	Blyth's Reed Warbler	Song Sparrow
Snowy Owl	Paddyfield Warbler	Pine Bunting
Hawk Owl	Aquatic Warbler	Black-headed Bunting
Tengmalm's Owl	Melodious Warbler	Red-headed Bunting
	Icterine Warbler	Yellow-breasted Bunting
	Olivaceous Warbler	Rustic Bunting
		Little Bunting

APPENDIX 2—OBSERVATIONS IN “RECENT REPORTS AND NEWS” NOT NOW ACCEPTED

For the sake of completeness, we are continuing our practice of listing claimed occurrences which appeared in the “Recent reports and news” but which we were unable to accept after full consideration. Records of this kind (other than Irish ones) rejected since our last report are set out below, unless the references in the “Recent reports and news” was qualified by “apparent”, “probable” or “unconfirmed” or unless it was in a brief summary without precise date or location. It should be added that these observations were not necessarily rejected because we felt the identifications were wrong. In a number of cases we believed the observer to have been right, but the evidence was insufficient or the conditions of observation too unsatisfactory for unqualified acceptance as a fully authenticated record. We should like to emphasize this because it has been suggested, quite incorrectly in our view, that published rejection is a slur on the observer.

1959

Ivory Gull Guardbridge, Fife, 4th October (*Brit. Birds*, 52: 440)

1960

White Stork Fareham, Hampshire, 13th June (53: 367)
 Kite Adhurst St. Mary, Hampshire, 14th July (53: 406)
 Crane Breydon Water, Norfolk, 4th and 8th May (53: 317)
 Kentish Plover between Minchcad and Dunster, Somerset, 8th July
 (53: 367)
 Ewhurst Green, Surrey, 8th October (53: 535)
 American or Asiatic
 Golden Plover Bardsey, Caernarvonshire, 6th April (53: 319)
 Greater Yellowlegs Camel Estuary, Cornwall, 22nd and 24th August
 (53: 534)
 Lesser Yellowlegs near Lewes, Sussex, 2nd October (53: 533-534)
 Grey-rumped Sandpiper Bardsey, Caernarvonshire, 8th-9th April (53: 319)
 Broad-billed Sandpiper Shell Beach, Poole Harbour, Dorset, 25th September
 (53: 535)
 Bonaparte's Gull Titchfield Haven, Hampshire, 5th September (53: 455)
 Sabine's Gull St. Catherine's Point, Isle of Wight, 27th August (53:
 455)
 East Fleet, near Weymouth, Dorset (two), 10th September
 (53: 455)
 White-winged Black Tern Portland Bill, Dorset, 18th May (53: 317)
 Rye Meads, Hertfordshire, 29th September (53: 535)
 Gull-billed Tern St. Catherine's Point, Isle of Wight (six), 28th August
 (53: 455)
 Herne Bay, Kent (two), 20th September (53: 535)
 Caspian Tern St. Catherine's Point, Isle of Wight, 27th August (53:
 455)
 Alpine Swift Gruinard Bay, Ross-shire, 3rd June (53: 318)
 Bee-eater Hill Head, Fareham (actually Titchfield Haven),
 Hampshire, 11th May (53: 279)

Aquatic Warbler	Titchfield Haven, Hampshire, 4th September (53: 539)
Icterine Warbler	Cuckmere Haven, Sussex, 11th September (53: 456)
	Cley, Norfolk, 21st September (53: 538)
	Sands of Forvie, Aberdeenshire, 5th October (53: 538)
Greenish Warbler	Kelling Heath, Norfolk, 1st September (53: 538)
	Cowplain, Hampshire, 2nd October (53: 538)
Bonelli's Warbler	Fareham, Hampshire, 27th-28th July (53: 406)
	St. Catherine's Point, Isle of Wight, 28th August (53: 456)
Richard's Pipit	Cley, Norfolk, 19th September (53: 541)
	Bardsey, Caernarvonshire, 18th October (54: 46)
Tawny Pipit	Yalding gravel-pits, Kent, 24th September (53: 541)
Red-throated Pipit	Pagham Harbour, Sussex, 10th May (53: 318)
Lesser Grey Shrike	Salthouse Heath, Norfolk, 15th-16th May (53: 317)
Black-headed Bunting	Guildford, Surrey, 18th and 28th August (53: 456)

The reported occurrences of two Ruddy Shelducks near Worthing (Sussex) from 8th September (*Brit. Birds*, 53: 456), an Alpine Swift over the Pentland Hills (Midlothian) on 14th August (53: 456), two Bearded Tits at Broxbourne (Hertfordshire) on 4th November (54: 46), an Icterine Warbler at Hartlepool (Co. Durham) on 17th September (53: 538) and a Greenish Warbler at Seolt Head (Norfolk) on 5th September, (53: 456), all 1960, were subsequently withdrawn.

More examples of the best recent work by British bird-photographers

(Plates 27-34)

A YEAR AGO we published a first selection of the best contemporary work by British bird-photographers (*Brit. Birds*, 53: plates 25-32) and announced that such a selection was to be an annual event. The second in the series appears in this issue. In these selections we aim to show the results of as many photographers as possible. We want to encourage the newcomers and those whose photographs are seldom seen, as well as to illustrate some of the latest work of the acknowledged experts. Certain species are photographed far more frequently than others and, as we wish to avoid publishing plates of the same ones over and over again, the selection is to some extent biased towards birds which have received less attention. In addition, it must not be forgotten that a number of the best recent photographs, particularly of less common species, appear in this journal in the normal course of events. For example, one or more of the remarkable studies of the Nightjar (*Caprimulgus europaeus*) by John Markham and Ronald Thompson (*Brit. Birds*, 54: plates 10-11, 13-14) would certainly have been selected if we had not already published them.

By presenting this annual selection we aim to keep a permanent record of the finest bird photographs in one journal. However, we cannot make the series completely representative unless we are able

to choose from all sources. The best work of the established photographers is exhibited at the Autumn Nature Exhibition of the Royal Photographic Society and in this and other ways we see a good cross section, but we appeal to *all* photographers to send us *any* photographs which they think have a chance of inclusion and which are not likely to come to our attention otherwise. Prints should be about eight inches by six inches in size and preferably have a glossy finish; the address of the photographer should be clearly written on the back of each, with the name of the bird, the date on which it was taken and the county (or, if abroad, the country). ERIC HOSKING

Obituary

Benjamin Hervey Ryves (1876-1961)

Lt. COL. B. H. RYVES of Wurdwan, St. Mawgan, Cornwall, who died on 21st February 1961 in Tehidy Chest Hospital, aged 85, was the doyen of Cornish ornithologists. Born in Multan in the West Punjab, he was educated at Westward Ho! and Sandhurst and passed into the Indian Army in 1896. He remained in that Service until invalided out in 1921. He then settled at St. Mawgan and devoted the rest of his life to the study and protection of birds.

In 1931 he founded the Cornwall Bird-Watching and Preservation Society and continued in office as a secretary until his death. Thanks largely to his inspiration, the society has grown in reputation and now numbers about 700. He has been a regular contributor to its annual report throughout its 30 years. In 1934 *British Birds* published his articles on polygamy in the Corn Bunting: these were based on three years' intensive study, in which he was assisted by his wife; they proved that in Cornwall most males were polygamous, having from two to seven hens each. His book *Bird Life in Cornwall*, which was published in 1948, provides a mine of information on the status and habits of Cornish birds in the first half of this century. He was a regular contributor of "Nature Notes" to the *Western Morning News* and many articles from his pen, mainly on breeding biology, appeared in *British Birds*, *Bird Notes* and other periodicals.

I first met Ryves in 1931 and at once fell under the spell of his warm-hearted and unassuming personality. One of the happiest results of our friendship was an expedition in 1938 with our wives and Mr. and Mrs. G. H. Harvey to the Isles of Scilly. This proved both enjoyable and rewarding, and led to the continued interest of the society in the bird life of those islands, with a regular section in its annual reports. A gentleman of the old school, Ryves was held in warm affection and esteem throughout the West Country. He leaves a widow and two daughters. R. H. BLAIR

Notes

Hérons fishing from the air.—At Abberton Reservoir, Essex, I have quite often seen Herons (*Ardea cinerea*) fishing from the air whilst circling over the water. This seems to happen mostly in early summer, perhaps because the Herons are hard put to find enough food for their young, or perhaps because shoals of spawning fish offer an easy target.

When fishing in this way, a Heron circles between ten and twenty feet above the water, then suddenly plunges quickly down, more or less head first, on to the surface, at the same time thrusting its head and neck beneath. The action gives the impression that the bird is “diving” in, but its body remains on the surface. The operation is generally successful. If the Heron catches a large fish, it rises easily from the water and flies to the bank to deal with it. Small fish, however, are swallowed as the bird floats on the surface, looking most peculiar. It is difficult to be sure whether it actually swims, but I think that occasionally it does so for a short distance.

If other Herons see this, they often fly to the spot and also begin circling and “diving”, and I have seen as many as seven fishing in this way at once. Black-headed Gulls (*Larus ridibundus*) take their cue from the Herons, of course, and join in. More surprising is the fact that a Heron standing on the bank will also hurry to join a flock of circling Black-headed Gulls.

R. V. A. MARSHALL

An apparent case of Herons being double-brooded.—In view of the paucity of records of Herons (*Ardea cinerea*) being double-brooded, it is interesting to note that in 1960 a pair of these birds apparently reared two broods in a nest at Par, Cornwall. The nest, which has been used regularly since 1957, is situated in an alder tree in the centre of a large marsh. On 6th April 1960, I noted that there was one chick in the nest and I saw this in or near the nest for some weeks after this date. I was therefore very surprised to find two fairly well-grown chicks in the same nest on 30th August. These I watched almost daily until 27th September, on which date they had left.

There is no definite evidence to prove that the two broods were reared by the same pair of birds and I cannot rule out the possibility that the chicks in August and September might have been a late replacement by another pair which had had their first nest destroyed. However, I think this is very unlikely as this nest is completely isolated and the nearest heronry is four miles away in the Fowey Valley. I do not even recollect seeing any other Herons in the immediate vicinity and the only complication is that on 30th May I found a roughly-

made new nest in a willow a few yards away. This was never used for breeding, however, and it occurred to me at the time that it might have been built by one of the previous year's young. However, as already stated, I saw no other Herons in the area and it seems much more likely that, having reared their first youngster, this lone pair attempted a second nest and then reverted to the original nest for a second laying (*cf.* F. A. Lowe's *The Heron*, p. 82). C. J. STEVENS

[We showed this note to F. A. Lowe who has commented, "The somewhat isolated nest seems to be unlikely to have attracted a second pair, though this cannot be ruled out. It is even more unlikely that the second brood would be a replacement by a young female of the previous year as cases of such birds laying are very rare and only proven on the Continent. I think it probable that this is an instance of double-brooding, as Mr. Stevens suggests." We feel that these facts are worth putting on record because the evidence for double-brooding is almost as strong as it can be in any case where the adults are not either ringed or otherwise distinguishable.—Eds.]

Disappearance of Sparrowhawk's eggs.—With regard to previous notes on the subject of eggs disappearing from the nests of birds of prey (*Brit. Birds*, 53: 128-130 and 221), I had a nest of the Sparrowhawk (*Accipiter nisus*) under observation during the spring of 1960 and the eggs disappeared in circumstances pointing suspiciously to the female being the culprit. The eyrie was situated in an oak, at a height of thirty-three feet, in a large wood near Farleigh, North Downs, Surrey. The framework of sticks and twigs was in position on 25th March, but I did not examine it *in situ* until 23rd April, when pieces of thin twigs were being added to the shallow depression. On 7th May the nest contained three eggs. On 14th May there were only two eggs; amongst the twigs on the top of the structure I found two small pieces of egg-shell but no trace of any egg contents, while amongst the undergrowth at the foot of the tree I came across a larger shell fragment. On 17th and 21st May the nest held three eggs, but when again examined on 4th June there was only one. Despite a careful search, I could find no trace of any egg-shell remains or egg contents amongst the twigs on the top of the nest, but on the ground below I came across fragments of egg-shell which were unquestionably those of the Sparrowhawk. On 18th June the eyrie was empty; between the twigs on the top I found two small pieces of egg-shell. I would mention that on 7th May the hen was not seen to leave the nest but was heard in the vicinity. On 14th, 17th and 21st May, and 4th June, she was brooding and left the nest as I climbed the tree.

HUBERT E. POUNDS

The food and feeding habits of a captive Oystercatcher.—On 31st March 1959 I received an injured Oystercatcher (*Haematopus ostralegus*) which had been found on the coast near Scarborough, Yorkshire. Its injuries were confined to the toes of one foot, from which two claws were missing, and to the knee of the other leg, which was considerably swollen. I decided to try to keep the bird alive until such time as I could release it in a reasonably healthy condition.

As the bird was rather emaciated on arrival I offered mealworms to it, and these were readily accepted. During the next few days it ate more mealworms and also Limpets (*Patella vulgata*). The latter were boiled for a short time in order to separate the shells from the bodies. A few days, however, served to show me that the bird could consume Limpets in a far greater quantity than I had imagined. I decided, therefore, to record the numbers of Limpets given on each occasion and the average size of each batch.

Since I had no facilities for weighing long series of boiled and shell-less Limpets, I recorded the length and breadth at the widest part of the largest and smallest shells of each batch and, by making an estimate where a large batch was concerned, recorded the same measurements for the average of each batch. Dewar (1913), dealing with the Limpet as a food of the Oystercatcher, gives shell measurements which vary from 1.75×1.5 inches to 0.5×0.43 inches, the average of 134 shells being 0.87×0.68 inches. From the estimated averages of each batch which I offered to my subject the average size of 4,795 shells was 1.07×0.76 inches. The average weight of 10 limpets with an average shell measurement of 1.1×0.9 was 1.13 gm. (When dealing with animals taken from shells measuring from 1.3×1.1 inches to 1.5×1.3 inches, my bird had difficulty in swallowing them whole; instead, it tended to part the foot from the viscera and swallow them separately.)

During the 23 days in which I kept records of the bird's food intake, it ate 4,795 Limpets. Since I noted, as accurately as I could, the time by which the Limpets had disappeared, a rather exaggerated figure for the period in which the food was eaten amounted to 445.75 hours. The highest figures for Limpets eaten in a known time were 100 in 3.5 hours, 114 in 4.5 hours, 90 in 5.5 hours and 407 in 22 hours.

Limpets still in their shells were overturned and the points of attachment were severed with a rapid nibbling action, after the tips of the mandibles had been thrust between the body and shell of the mollusc. Sometimes, however, the shell and body would not part and on these occasions the bird picked up the mollusc and beat it with great rapidity against a hard surface, usually a metal dish. A tape recording of this operation was quite impressive, the rapidity of the blows calling to mind the drumming of a woodpecker. Dewar says that the bird deposits its prey on sand or in a crack or crevice in

rocks before chipping through the friable attachments of the mollusc to the internal surface of the shell. My subject did not wedge its whole Limpets in any way before attacking the attachment points and often pushed one for a considerable distance while nibbling vigorously.

In addition to Limpets, the diet of this Oystercatcher included mealworms, three pints of shell-less Cockles and one egg of domestic fowl. The last I gave to the bird after it became very agitated on one occasion when I stood by its cage with the egg in my hand. While the egg was entire the bird rolled it about the cage with its bill and pecked at it, but when I cracked the egg slightly the bird thrust its bill through the shell and greedily devoured the contents. Young terns and eggs are included by *The Handbook* in the diet list of this species.

In due course the bird recovered except for a slight limp. It became very restless and, since confinement was no longer practicable, I released it on 29th April 1959.

T. M. CLEGG

REFERENCE

DEWAR, J. M. (1913): "Further observations on the feeding habits of the Oystercatcher (*Haematopus ostralegus*)."
Zoologist, 4th ser., XVII: 41-56.

Ruff displaying to Knot.—I should like to place on record the peculiar behaviour of a Ruff (*Philomachus pugnax*) at Minsmere, Suffolk, on 24th July 1960. While I was watching from the wooden hide near the shore this Ruff, apparently a young male, and a Knot (*Calidris canutus*) in full summer plumage landed on the mud in front of me. The Ruff immediately started circling round the Knot, bowing its head so low that at times it scraped the mud at the other's feet with its bill. The Knot did not appear to welcome this attention and kept turning away, but the Ruff would run round in front each time and continue the bowing and bobbing action. The Ruff then collected some feathers and pieces of vegetation which it laid before the Knot, afterwards attempting to mount. It appeared to be in a highly excited state all the time, never remaining still for a moment. When the Knot flew off, the Ruff followed closely and repeated the performance. The Ruff was most persistent and this behaviour must have continued intermittently for the best part of two hours until it became too dark to follow them further.

R. G. H. CANT

Sand Martins nesting in a heap of sawdust.—At Ardbrecknish, Argyll, the Forestry Commission cut up a large quantity of timber about ten years ago. At the place where this was sawn they left a horseshoe-shaped pile of sawdust and waste timber. The outer sides of this gently slope to a height of about eight feet and in the centre

there are vertical faces. In May 1960, when I visited the site, I found that these sawdust "cliffs" held a breeding colony of Sand Martins (*Riparia riparia*). There were, in all, about twenty nesting holes, none of which was more than six feet from ground level. Donald Bell, a local ghillie, told me that the birds had been there since 1955. The sawdust was damp and very firm; it showed no tendency to collapse and additional support was provided by the numerous pieces of timber embedded within it. I know of no other record of Sand Martins nesting in this sort of situation. R. A. F. Cox

[*The Handbook* states that Sand Martins "exceptionally" breed in "drain-pipes projecting from wall, holes in brickwork, sawdust heaps, etc." Nevertheless, though earlier volumes of *British Birds* contain a number of observations of this species nesting in pipes, in cracks in walls and even in turf roofs in Scandinavia, we have been unable to trace any published record of a site comparable to that described by Dr. Cox. However, R. A. O. Hickling informs us that he knows of a colony of Sand Martins which nest in a heap of compressed granite dust at a quarry.—Eds.]

Large flocks of Ravens at food.—The flocking of Ravens (*Corvus corax*) has been frequently recorded. Gregarious roosting is common, especially in the Hebrides where as many as 276 were counted by A. B. Duncan at a roost in North Uist in 1938 (Baxter and Rintoul 1953). The same authors give several examples of flocks at unusual food supplies such as cattle offal, the gralloch of deer, dead whales in Shetland or stranded grampuses, the highest figure being "about 800 on 18 June 1864 at Uyea Sound in Shetland".

Most accounts of large flocks concern autumn gatherings, but breeding season flocks have also been recorded: for instance, over 100 in March in Somerset (*Report on Somerset Birds*, 1953); 40-50 on 27th March 1946 in Carmarthenshire, and the same flock through the breeding season in 1947 (Bryson 1947, 1948); up to 70 using a roost in Merionethshire reached a peak in September but "suffered no falling off in numbers during the nesting season" (Cadman 1947); a flock of 26 on 1st June in Iceland (Young 1949).

Coombes (1948), in an account of flocking of Ravens from twenty years of observations in the Lake District, gives only one instance of a gathering for the purpose of feeding, an autumn flock of 16 birds at the gralloch of stags. From his own evidence he says that "some other reason must be found to account for the very large gatherings of ravens which are sometimes seen and for all gatherings at other times of the year" (i.e. other than autumn). Though his records cover only the Lake District, this general statement does not appear to have

been challenged and yet there are many published instances of large flocks drawn to unusual sources of food.

In April 1959 we found one such example in Pembrokeshire, at Cuffern Mountain about four miles inland from Newgale. This flock, drawn to a knacker's yard where the birds fed on the slaughterhouse offal, seemed to be quite well known. At the time many pairs of Ravens were feeding young in nests along the cliffs of St. Bride's Bay, but these were seldom seen to stray far from their breeding territories so that the inland flock was undoubtedly composed largely of non-breeding birds. On 17th April, when we put up a hide to film the gathering, about thirty or forty Ravens were visible scattered over the hillside waiting, so we were told, for the workmen to finish at 5 p.m. The following day, a Saturday with no disturbances, we filmed the birds, using scraps of meat as bait. At first they were shy; but soon, encouraged by the boldness of a Great Black-backed Gull (*Larus marinus*), about forty Ravens were fighting over the food only a hundred feet from the hide. Although I had been conscious of much activity near-by, I was still surprised, on emerging suddenly from the hide, to see how many birds had been attracted to this one area. When the flock at the bait took to wing many others rose from the surrounding grass and from perches on walls and trees along the hillside. Scanning carefully through the whole loose flock, I reckoned that there were just over 150 birds, all Ravens. This seems to represent a very large non-breeding population drawn from a wide area to a plentiful local food supply, as it is very unlikely that the flock contained any birds of the year or breeding adults.

It is interesting to note, however, that only two days before this, at a casual roadside stop about fifteen miles away, east of Haverfordwest, we noted a flock of fifty adult Ravens at a farm midden, with four Magpies (*Pica pica*), two Common Buzzards (*Buteo buteo*) and a large number of Carrion Crows (*Corvus corone*). It was noticeable at the Cuffern Mountain site that, apart from one or two gulls, the Ravens appeared to have the food supply entirely to themselves.

C. K. MYLNE

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Cetti's Warbler in the Channel Islands.—On 16th October 1960, at 1730 hours, a small brown warbler was caught in the Heligoland trap at St. Ouen, Jersey, Channel Islands, by A. le Sueur and F. R. Lawrence. It was taken to the bird observatory hut where it was identified as a Cetti's Warbler (*Cettia cetti*) by these observers and F. le Sueur, M. L. Long, J. H. Richards and the writer. After being ringed, the bird was kept overnight as it was so near dark. It was then photographed the next morning by F. le Sueur and K. le Cocq, who afterwards released it near the reeds surrounding St. Ouen's Pond where it had been caught. It flew strongly across the pond into the reeds and was not seen again. The following description is combined from the notes of the observers:

Size about $5\frac{1}{2}$ inches. Entire upper-parts a drab dark brown with a chestnut tinge (M.L.I., R.L.); a drab grey-brown (F.le S.). A darker, almost black, diffuse stripe through the eye contrasted with a dull white and fairly broad superciliary. Entire under-parts dull dirty white. Sides of neck and flanks greyish-brown. Tail-feathers with chestnut fringe on outer webs, wing-coverts with chestnut fringes and tips. Legs and feet flesh-brown, iris brown, bill black with pink base to underside of lower mandible; nostrils uncovered. *Wing-formula*: longest primaries 4th and 5th equal; 3rd 2 mm. less; 2nd 9-10 mm. less; 1st approximately twice length of primary coverts, as broad as other primaries and round-ended; slight emarginations on 2nd to 6th. *Measurements*: wing 58 mm. (both); bill $14\frac{1}{2}$ -15 mm.

This description includes everything that was actually written down. By mistake, no details were taken of the distinctive under tail-coverts, though it should be added that these were compared at the time with the description and diagram in *The Handbook* and found to agree completely. Several rectrices were missing and this precluded any measurement of the tail, but one observer (F.R.L.) had an impression of a rounded tail as the bird flew into the catching box.

The preceding week in Jersey was one of strong (force 3-5) northerly winds. This is the first record of Cetti's Warbler for the Channel Islands. R. LONG

[We do not normally publish individual records from the Channel Islands because they fall outside the area covered by the B.O.U. *Check-list of the Birds of Great Britain and Ireland* and *The Handbook*. However, this occurrence is of general interest because Cetti's Warbler, which is normally completely sedentary, has been thrusting northwards in France and recently one was reported in Hampshire (*Brit. Birds*, 54: 172).—EDS.]

Yellow Wagtail wintering in Surrey.—During the winter of 1960-61 a cock Yellow Wagtail (*Motacilla flava flavissima*) was again recorded at Beddington sewage farm, Hackbridge, Surrey. The bird was first noted on 27th November 1960 and last definitely seen on 26th March

1961, the first migrants being present a few days later. This is the third occasion that this species has wintered at Beddington (*Brit. Birds*, 50: 353; 53: 226-227). B. S. MILNE

Red-tailed Shrike at Fair Isle.—An adult male Red-tailed or Isabelline Shrike—a representative of a distinctive Asian group of shrike populations now regarded as belonging to the same species (*Lanius cristatus*) as our Red-backed—was at Fair Isle during a rush of Continental birds on 12th and 13th May 1960. It was examined in the hand on the second day and was thought to belong to the race *phoenicuroides*, which breeds (according to C. Vaurie, *The Birds of the Palearctic Fauna*, 1959) in the Transcaspiian area, from the southern Kirghiz Steppes, Zaisan Nor, and the Aral Sea region, south to North Afghanistan, Baluchistan and eastern and southern Iran; and winters in eastern Africa. As mentioned in a recent statement by the Rarity Records Committee (*Brit. Birds*, 53: 427-428), four races are recognised in the Red-tailed (*isabellinus*) group of shrikes, which are currently regarded as conspecific with the Red-backed (*collurio*) and Brown (*cristatus*) groups. Racial assessment was not considered possible for the two previous British specimens, an adult male watched at the Isle of May, Fife, on 26th September 1950 (*Brit. Birds*, 44: 217-219, colour frontispiece), and a juvenile seen at Portland Bill, Dorset, on 10th September 1959 (53: 427); but on purely geographical grounds *phoenicuroides* would be the most likely to occur in Europe, as the other three forms, *specigulerus*, *isabellinus* and *tsaidamensis*, breed and winter further to the east.

When I first noticed the Fair Isle bird, on the bright sunny afternoon of the 12th, it was perching on telephone wires above the marshy ground of Gilsetter. It was some 70 yards distant and its apparently pure white breast caused me to think that it was a male Woodchat (*L. senator*) that had been seen near-by a few hours earlier. Through binoculars, however, I saw that the head was grey above a bold black facial mask and, as the shrike turned and flew, at some 50 yards' range, the tail seemed conspicuously red, and a narrow but distinct white bar showed on the dark wing. I followed it to a wall about 120 yards away and was able to get within 25 yards. The upper-parts were medium grey or grey-brown and the flanks suffused with rufous-buff. The tail was much the same colour as that of a Redstart (*Phoenicurus phoenicurus*), but appearing rather paler towards the tip. The bird again flew away, along the wall, and at this stage I was joined by G. J. Barnes and A. Pringle. Together we pursued it along various walls for about an hour, but it always flew considerable distances to settle on prominent features and never allowed us within 40 or 50 yards. Eventually it passed over the moorland of Byerwall and was lost. We did not find it again until next morning, when it had returned to

the original area. It continued to be very wild and attempts to chase it into the Heligoland traps and mist-nets were not rewarded. It was now seen by W. Crawford. Later in the day, I found it using the roof of the Joint Schools trap as a vantage-point from which it repeatedly flew to the ground to take insects from the turf; after about half an hour it dropped into the mouth of the trap and in a frantic dash I deflected it into the catching-box.

The following is a summary of the details recorded in the laboratory:

Lores and ear-coverts jet-black, bounded above by narrow white supercilium which extended indistinctly across forehead. Crown and upper-parts sandy grey-brown, tinged slightly more rufous on upper forehead. Lower rump and upper tail-coverts red-brown. Tail "Redstart-red" (a Redstart was present for comparison), with slightly darker central feathers, and outermost rectrices almost white at the outer edges. Under-parts white, tinged warm buff across upper breast and deeper rufous-buff on flanks and near vent. Wings dark brown with buff edgings on flight-feathers, very narrow on primaries and secondaries but broader on tertials; white bases to primaries exposed as wing-patch about 5-8 mm. wide. Flight-feathers slightly abraded, but otherwise plumage appeared little worn. Bill and legs blue-black, eye dark brown. Measurements: wing 95 mm., bill 16, tarsus 24, tail 82; weight 28.0 gm. at 1405 GMT.

The specimen's assignment to *L. c. phoenicuroides* was based mainly on the descriptions in Vaurie (*op. cit.*). The paler eastern races, *isabellinus* and *tsaidamensis*, seemed unlike our birds in that in their cases the facial mask is brownish-black, the upper-parts are sandy-yellowish in shade and the wing-mirror, if present, is tinged with buff. Both these forms and also *specigulerus* (which is intermediate between *isabellinus* and *phoenicuroides*) have creamy-white, not pure white, under-parts. The Fair Isle bird was considerably darker and greyer above than is shown in the painting of the Isle of May example by Miss W. U. Flower (*Brit. Birds*, 44: frontispiece), though it may be noted that this illustration and its accompanying description favour *phoenicuroides* in respect of the mask, the alar patch and the under-parts.

Our bird was ringed (613671), photographed in colour by my wife and released at the Observatory. It was not seen again.

PETER DAVIS

Review

Birds in Camera. By Karoly Koffán. Barrie and Rockliff, London, 1960. 210 pages; 166 photographs (10 in colour). 27s. 6d.

This is an English version of the book first published in Budapest, also in 1960. Some of Mr. Koffán's work is already familiar to readers of *British Birds* from his photographs of Rock Thrush, Ortolan Bunting, Scops Owl and Lesser Grey Shrike published in this journal over the past five years. These are among the twenty characteristic Hungarian

birds illustrated in the book under review, which also includes such other (to British eyes) "exotics" as Black Redstart, Wryneck, Hoopoe, Roller, White-spotted Bluethroat and Penduline Tit. The text is complementary to the photographs and gives a most readable account of the difficulties encountered and how they were overcome. Mr. Koffán is, amongst other things, a painter, and one of the chief merits of his book is the care taken to explain not merely the mechanics of photography but also the effect which he is trying to achieve and the extent to which he thinks he has succeeded or failed. He is writing more particularly for the amateur bird-photographer and he expressly disclaims any intention of writing a scientific work, but one feels some regret that he does not make more mention of his own work on the identification by photography of food brought to the nest.

The photographs vary widely in quality. Many are excellent, and some of the others justify their inclusion by serving as the subject of critical discussion in the text. But the book would have been improved by a rather more critical selection and by the inclusion of some habitat photographs, the lack of which is felt all the more strongly because the author is primarily concerned with obtaining portrait studies of the birds rather than showing them against their natural surroundings. More often than not the nest merely serves as an off-stage inducement to persuade the bird to pose on some predestined perch, with only the sky as a background. The resulting portraits are often very striking, but this approach does tend to lose something in plumage detail and in a series of such photographs the repeated absence of background becomes almost oppressive. What can be achieved by this technique is most clearly shown in the colour photographs (especially those of Roller, Rock Thrush and White-spotted Bluethroat) where the backgrounds, although largely featureless, make an active contribution to some quite superb photographs.

This is a stimulating book, and in spite of the publishers' lurid promise of photographs "sometimes startling in their candour" it can be recommended as safe reading for junior as well as senior ornithologists.

D. G. ANDREW

Notices

Arnold Boyd Memorial.—The Arnold Boyd Memorial Appeal, which was announced in our March issue (*Brit. Birds*, 54: 129), has now raised more than two-thirds of the £750 required to build and equip the proposed observation hut overlooking Rostherne Mere in Cheshire. In order that the appeal may be closed and the hut erected before next winter season, we hope that more of the readers of this journal will mark their appreciation of the fifteen years that Arnold Boyd was one of its editors by contributing something towards the last part of the necessary sum. Donations should be sent to the Honorary Treasurer, Manchester Ornithological Society, c/o Messrs. Henry Erin & Co., 11 Albert Square, Manchester 2.

Bird observatory training course.—A week's course combining ornithological field-work, lectures and practical demonstrations in bird observatory techniques will be held at Gibraltar Point Bird Observatory, near Skegness, Lincolnshire, from 26th August to 2nd September 1961. It will be under the joint auspices of the observatory and the British Trust for Ornithology, whose Migration Research Officer, Kenneth Williamson, will have charge of the programme. The aim of the course is to train bird-watchers who already have some ringing experience to a standard which will enable them to take charge of scientific work, should they visit unwardened bird observatories. Information concerning the programme and enrolment can be obtained from Mr. Williamson at the British Trust for Ornithology, 2 King Edward Street, Oxford.

XIII International Ornithological Congress.—As already announced (*Brit. Birds*, 54: 132), the XIII International Ornithological Congress will be held in the United States at Cornell University from 17th to 21st June 1962. The official announcement and application for membership are now ready for distribution. Interested persons who have not already done so should send their names and addresses to the Secretary-General (Prof. Charles G. Sibley, Fernow Hall, Cornell University, Ithaca, New York, U.S.A.) *as soon as possible*. A small fund has been obtained to provide partial support for the travel of a few persons coming from outside North America. Application forms will be sent to persons requesting them (citizens of the United States and Canada are not eligible). All applications for membership, travel grants and places on the programme should be returned to the Secretary-General before 1st December 1961 (and not by 1st February 1962 as previously announced).

Requests for information

Specimens of dowitchers.—In connection with notes that we are proposing to publish in *British Birds* on the separation of the Short-billed and Long-billed Dowitchers (*Limnodromus griseus* and *scolopaceus*) (see page 184) and on past occurrences of these two species in Great Britain and Ireland, I. C. T. Nisbet is anxious to trace the whereabouts of as many as possible of the specimens shot in the nineteenth century (see *The Handbook*). They will probably be labelled "Red-breasted Snipe" and the scientific name may be either *Limnodromus* or *Macrorhamphus griseus*. Anybody who can help is asked to get in touch with Dr. Nisbet at Haslingfield Vicarage, Cambridge.

Early breeding in 1961.—The unusually late breeding of some species in autumn 1960 was followed by odd reports of nests in December and, with the continued mild weather, a possibly unprecedented number of birds seem to have started breeding in the first three months of 1961. The Turdidae were most involved, but reports have been received of several other species. To obtain as complete a picture as possible, H. Mayer-Gross (organiser of the B.T.O. Nest Record Scheme) would like to receive information on all early nests of any species. It is hoped in due course to publish an analysis comparable to those on the early breeding in the winter of 1953-54 and the spring of 1957 (*Brit. Birds*, 48: 120-126; 52: 74-83). Where possible, the following details should be given: locality, nest site, dates of laying, hatching and fledging, clutch and brood size, and the fate of the nest. Comparable data for previous seasons would also be welcome. In addition, it would be useful to know what proportion of the population of any species nested early and to have an indication of the species which did not apparently start until the normal time. All records should be sent to Mr. Mayer-Gross at the British Trust for Ornithology, 2 King Edward Street, Oxford.

Notice to Contributors

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34. Various other conventions concerning references, including their use in the text, should be noted by consulting examples in this issue.

4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

5. Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.

Charles Frank
of GLASGOW

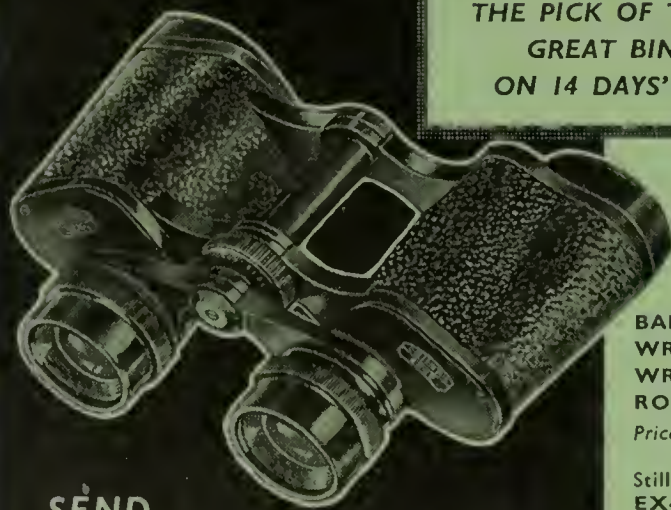
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British Birds

Vol. 54 No. 6

JUNE 1961



The pair relationship and polygyny in the Stonechat

By E. D. H. Johnson

THE MOST CASUAL OBSERVER cannot fail to be impressed by two characters of the Stonechat (*Saxicola torquata*)—its striking sexual dimorphism and the fact that it is seen to be paired at all seasons.

During a twelve-year study of the species, chiefly in Jersey in the Channel Islands, but also on the continent of Europe, one of my principal objects was to investigate the function of these two characters within the pair relationship. The work of Lebeurier and Rapine (1936) in Brittany in the early thirties of this century and of the Parrinders (1945) in Devon in 1943 and 1944 has provided the greater part of what is known of the Stonechat's breeding biology, but the revelation of individual life histories, in the field, had to await the development of trapping and colour-marking techniques.

The area I chose for my work was a two-and-a-half-mile stretch of coastal dunes and marram-covered wasteland with small areas of reed-bed and gorse extending a quarter of a mile inland, in St. Ouen's Bay, Jersey. The technique employed was to colour-ring as many birds as possible, of all ages, at all seasons of the year and to visit them on every possible occasion, noting all behaviour, however trivial, and the relationships between individuals. The work was particularly intensive between the autumn of 1954 and the winter of 1958, when almost complete coverage was achieved in the ringing of adults and all nests in the area were found. The following is a report on experiences with some 510 colour-marked birds.

INITIAL PAIR-FORMATION

Stonechats pair after the assumption of their first-winter plumage. On arrival in their wintering area, either by dispersal from elsewhere in the locality, or by immigration from farther afield, birds of the year

intermingle with residents which have bred in the district and which are just emerging from their moult. During this period, which may extend from late August to early October, according to the length and success of the breeding season, the pair-bond of the old birds is relaxed and exchanges of mates may take place. Pair-formation is initiated by the males excitedly chasing the females with loud "chacking" calls; and by the end of October all couples occupy and defend territories, in which they remain for the winter.

THE WINTER TERRITORY

During November, the male perches conspicuously on prominent features within, and bordering, the territory and initiates each move of the pair thereby, patrolling and defining the boundaries. The female perches lower and less conspicuously. Gradually this relationship gives place to a levelling of the parts played by the sexes until, with their own and their neighbours' territorial boundaries well defined, and their activities devoted primarily to obtaining food, the pair remain principally on the ground as they feed. The male no longer shows his breast and under-parts and becomes as inconspicuous as the female, both thereby becoming less vulnerable to avian predators. This feeding behaviour characterises the movements of the pair throughout December and January, and undoubtedly gives rise to many of the reports of Stonechats leaving areas in which they must obviously winter. At this season they may even join flocks of finches which forage through their territories.

The winter territory, depending on topography, may be as large as 150 yards in diameter and while feeding on the ground the pair may be separated at times by as much as fifty yards. Such separation seldom lasts long, however, and one or other of the birds, on finding itself isolated from its mate, will rise in the air and hover to locate it, then rejoin it at speed, flying close to the ground.

COURTSHIP AND THE COLLAPSE OF THE PAIR-BOND

In late January the pair begin to behave less furtively again. Territorial activity increases in intensity, with re-established boundaries, and increasing initiative is taken by the male, who begins to sing about 14th February. The intensity of song is dependent upon the number of adjacent males and the extent to which they intrude. In years of low population-density song may be heard very rarely. No observations were made of a direct relationship between song and courtship. Courtship begins in early March, the male chasing the female around the territory in aerobic flights, calling with a loud "chacking". The chasing gradually increases in frequency and intensity until, at a time when the birds have arrived at an advanced state of physical

excitement, the pair-bond is suddenly relaxed and, for a period varying from a few hours to three or four days, the birds in adjacent territories may be seen intermingling, with little or no aggressive behaviour. This event shows a remarkable synchronism throughout the population. The pair-bond is restored as suddenly as it was broken and by the time that territorial behaviour is resumed some exchanges of mates have taken place. The majority of pairs, however, continue paired as before.

The function of this sudden collapse of the pair-bond, at such a critical stage in pre-nuptial development, is of intense interest, but, once it has been recognised and accepted, a number of explanations suggest themselves.

In areas where the Stonechat is a winter visitor, the occurrence of such a break in the pair-bond may precede departure on northward migration in spring. Similarly, where the species is principally resident, the phenomenon may ensure the integration of newly arrived spring migrants into the population with the greatest economy of effort, at a time when all birds are in a condition of advanced sexual development, and assist the pairing of sexually matched individuals. Since close study of large numbers of Stonechats, in the field, has revealed appreciable differences in the intensity of behaviour of individual birds, the relaxation of the pair-bond in spring may also permit pair-formation between "compatible" males and females.

These hypotheses require, and are receiving, further investigation.

THE BREEDING CYCLE

Following re-affirmation of the pair-bond, the latter part of March is devoted to nest building. It is also a time of display, the male chasing the female around the territory between periods of feeding. Building takes place principally in the early mornings, but this is by no means an inflexible rule and it is rarely carried out with any great urgency unless it has been held up by bad weather. The male shepherds the female towards the nest site when she arrives with material, but he does not accompany her as he does when she is feeding. Occasionally the female may leave the territory completely to go to a place where suitable lining material is available, and then he remains conspicuously perched on his principal observation post which is by then an important feature of the territory.

The pair may become very much less conspicuous during the building period and it is at this time that what I have tentatively termed "false incubation" behaviour may take place. When this occurs, the female goes down in the vicinity of the unfinished nest whilst the male remains on guard, singing or feeding, exactly as if she were on eggs. Periodically, he calls her up and perches above her whilst she feeds.

I have, on several occasions, been misled by this behaviour into thinking that the female was incubating, when in fact she was only in the early stages of building. This behaviour can continue throughout the building period and merge with the true incubation pattern on completion of the clutch.

Mating usually takes place from one to four days before the first egg is laid. It is the culmination of the final phase of display in which chasing and "chacking" give place to visual stimuli effected via the white neck- and wing-patches of the male. Normally these are at least partially occluded by darker plumage, but as he crouches with his back to his mate, body bowed and trembling and wings drooping, they are exposed in such a manner as to appear almost to fluoresce.

Eggs are laid, in Jersey, quite consistently between 0600 and 0700 GMT, the female being accompanied to, or enticed towards, the nest by the male. During the laying period, the pair remain away from the immediate vicinity of the nest site, unless they are engaging in "false incubation".

Incubation begins as soon as the clutch is complete, but it may be delayed by adverse weather conditions, in which case the female becomes most inconspicuous away from the nest site and the male assumes a purely defensive rôle. From the start of the incubation period, he spends most of his time on the principal observation post, placed as conspicuously as possible, singing, hovering to greater height to observe intruders, and patrolling the boundaries of the territory.

A human or other animal intruder will cause the male to utter a warning *chuck* to the female, and when this is repeated with greater urgency she may slip quietly from the nest. More often than not, however, she remains on the nest, where, with her dull brown coloration, she is practically invisible in the entrance tunnel of grass or dead gorse. An intruding Stonechat will be sung at until the extent of his or her intrusion causes the defending male to move into the attack and an aerobatic chase ensues, with the defender invariably the victor.

A closer approach to the nest on the part of a dog, cat or human elicits a loud, insistent series of *whit . . . whit . . . whit . . . whit* calls from the male, who flies to a conspicuous perch away from the nest and from there starts an elaborate distraction display, rising and falling in hovering flight as if suspended on a string; after this he begins to move farther from the nest, sometimes dropping into cover, darting close to the ground in level flight to reappear ten yards farther away still, again hovering and bobbing to claim the intruder's attention. Meanwhile, the female, if she has left the nest, perches inconspicuously in a place of vantage, below the top of a bush or other feature, concealed by her drab coloration. If the intrusion occurs within a few feet of the nest she will join the male in making a clamour. Her dis-

traction display is not as elaborate as that of the male and she will normally perch closer to the intruder with a greater show of belligerency.

During incubation, the male calls the female off the nest at intervals varying from 45 to 75 minutes. He accompanies her as she feeds, perching above her as she moves about the territory. When she returns to the nest, he at once goes to his observation post and sings a few phrases before going down to feed himself. The young hatch after thirteen to fourteen days and for the first two to four days after this the male takes no part in feeding them, but continues with his defence of the territory, occasionally accompanying the female as she gathers food. By the fifth day, however, he is invariably carrying food and after this his territorial behaviour declines as he takes a larger share of the responsibility of caring for the brood.

On or about the twelfth day after hatching, the young begin to move around in the nest and even to leave it for short periods. At this time the alarm call undergoes a sudden change by the introduction of a second component, a *chack*. As the situation demands, either or both parent birds will utter a series of phrases which are a combination, in an irregular sequence, of *whit* and *chack*. Observation indicates that the *whit* component has the function of drawing attention to the adult bird which is calling, whilst the *chack* is used to communicate instructions and warnings to the young and between the pair.

The young finally leave the nest, one at a time, over a period of several hours. At this time the parents are in close attendance and the language consists of quiet "chacking" calls as the adults locate them in dense cover and feed them. After twenty-four hours the family party begins to move away from the immediate vicinity of the nest and the excitement diminishes.

By the end of a week the young are beginning to show themselves and the parents assume divergent roles again. The male takes charge of the young, leading them about the territory and sometimes beyond its bounds; feeding them progressively less until they no longer solicit food; chivvying them from their perches by diving at them and forcing them to fly; and calling them together at dusk to roost in close proximity. Whilst thus engaged, he begins to re-define the boundaries of the territory. He may resume song, and under cover of the general family activity he courts and mates with the female, who began to build her second nest when he assumed responsibility for the care of the young. During the second incubation period the male leads the young of the first brood out of the territory and they disperse. The cycle then continues as before.

Three broods are most commonly reared, but I have known four clutches to be laid and three broods fledged successfully from them

when the second brood was lost to a predator a few days before it was due to leave the nest.

DENSITY DEPENDENCE

Population density has an appreciable influence on the breeding activities and behaviour of the Stonechat, since the welfare of the pair depends largely upon the success of the male in his defensive task and the amount of effort he is required to devote to patrolling his borders and warning-off and chasing intruders. The significance of density dependence in the breeding biology of this species will be discussed more fully elsewhere, but it is appropriate to mention here that the number of broods is very much affected by the density. Of greater interest in the present context is the fact that, under conditions of low population density, males whose territorial boundaries do not march with those of another pair, and who are therefore relieved of the necessity to play an active part in defence, may take advantage of a slight numerical superiority of females in the vicinity. I have known three cases of polygyny in my study area, and these are discussed later in this paper.

AUTUMN DISPERSAL AND MIGRATION

The last brood of the season normally stays with the parents throughout the moult, during which time the old birds remain extremely inconspicuous within their territories. In early September, the young of the year begin to disperse; some may remain near the place of birth, but others migrate. It appears that, at least in Jersey, autumn migrants are invariably birds of the year. This is confirmed by a newly evolved ageing technique, based on the small amount of grey coloration within the mouths of young birds (E. D. H. Johnson in Cornwallis and Smith 1960). Other patterns of migration may, of course, be found throughout the species' wide distribution in the Old World.

One of the principal wintering grounds for northern Europe's emigrant Stonechats is the Iberian Peninsula, particularly along the south-east coast of the provinces of Malaga and Almeria, where, so J. A. Valverde informs me, it is the commonest bird in winter.

In one of the greatest concentrations of Stonechats that I have ever seen, near Estopona, on the south-east coast of Spain, in early November, pairs were defending territories less than fifty yards across and these abutted on one another for at least ten miles along the coast and a quarter of a mile inland. Here territorial behaviour was organised to the extent that both sexes played an equal part in a constant struggle to maintain the boundaries.

My own observations, particularly in Spain, have shown that, whilst they may not be paired when actually on the move, Stonechats rapidly

pair and take up territories in any area in which they pause on passage. Resident males may then sing in defence of their territories and their mates; while interlopers will chase females with loud "chackings" and (in at least one case in southern Spain) the display of white patches, indicating a high level of sexual excitement.

POLYGYNY

In the following discussion of the three cases of polygyny briefly mentioned above, reference is repeatedly made to a number of colour-ringed individuals. In the interests of clarity, however, actual colour-codes which involved the use of four rings, two on each leg, have been abbreviated.

The first case came to my notice in the spring of 1955, when a pair, the male of which had been colour-ringed Orange/Black in late January, began incubating on or about 23rd April. During the latter part of the incubation period, I noted that the male was dividing his time fairly evenly between the sitting female and an area at least four hundred yards to the south. On several occasions I saw him there in company with a female and it was soon apparent that she was much darker than his known mate, who was a particularly "ashy" bird. It was not until 16th May, however, the day after his known brood left the nest, that I found him carrying food to a second nest; this I located on the following day, when he was feeding a well-fledged brood of six young in company with the "dark" female. Extrapolation of the dates and data suggests that the first egg in the second nest was laid approximately two days after that in the first nest; and examination of my earlier notes in the light of my later knowledge showed that the male had been dividing his time between the two females in accompanying them to feed off the nest during the incubation period, and similarly in sharing with both of them the duties of feeding the young. The second female retired from the area whilst the male had charge of her young. The first female laid again within a few yards of her first nest.

The next two years produced two further cases of polygyny which I was more fully able to document, and which illustrate the extraordinary ability of the male to vary his behaviour to correspond with that of females in different stages of the breeding cycle.

The male of a pair caught and ringed in January 1955 was colour-coded Orange/Red. The following April, during the period of relaxed pair-bond, he changed his mate for a female who was colour-ringed Red/Green. They bred and remained paired until late October, when he again changed mates; the new female was ringed Orange/Blue. During the latter part of March the male began to divide his time between the territory they occupied and an area four hundred yards to

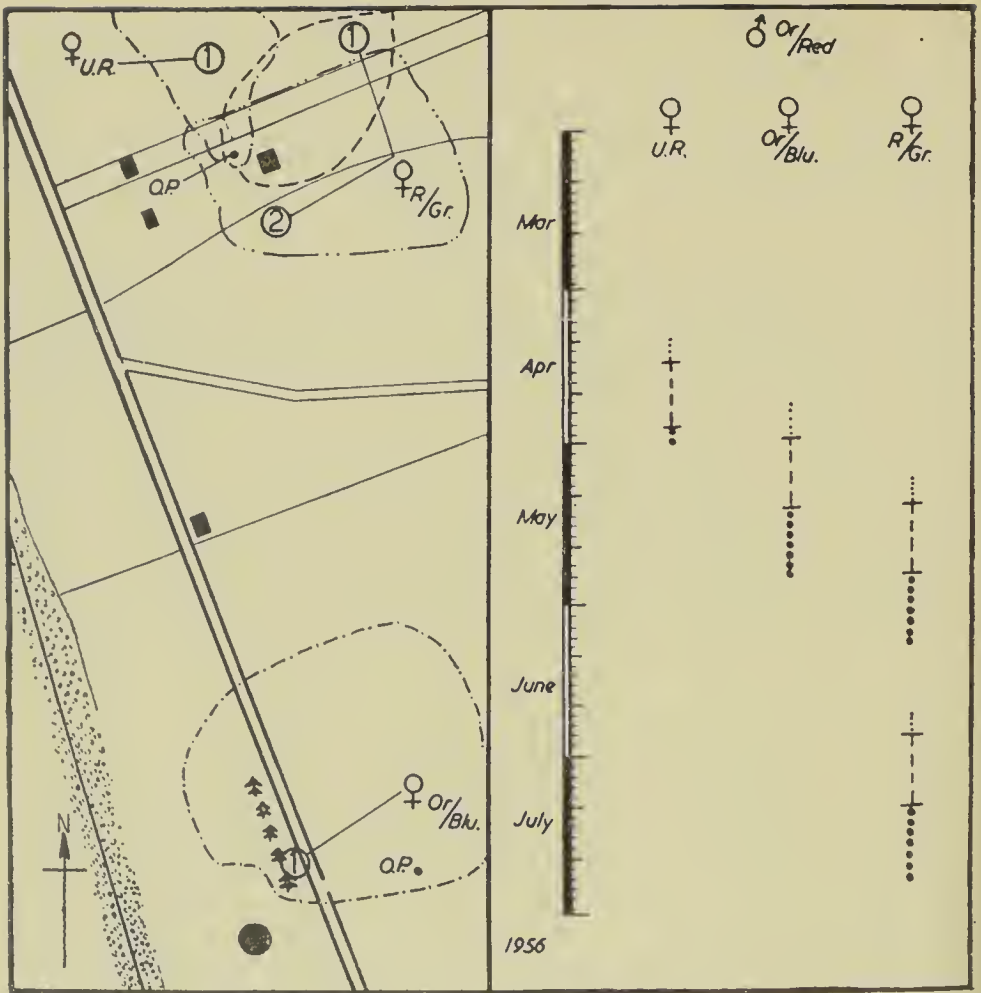


FIG. 1. Polygyny in the Stonechat (*Saxicola torquata*), St. Ouen's Bay, Jersey, Channel Islands, 1956. The territories concerned in the polygynous relationship between the male Orange/Red and three females, Unringed (U.R.), Orange/Blue and Red/Green. The area consists of marram-covered wasteland bordering the sea. The vertical side of the figure covers a distance of 500 yards. Nest-sites are represented by circles, while the numbers are the brood numbers of the females concerned. On the right of the plan is a seasonal comparison of the stages in the breeding cycle reached by each female; in this the small dots, dashes and large dots represent laying, incubation and fledging periods respectively

the north (Fig. 1) where he was frequently seen with an unringed female, holding a territory. He had a regular observation post in each territory, but only the more northerly one, at the top of an electricity pole, enabled him to overlook the whole area. Then on 4th and 5th April he was also seen in company with his mate of the previous season, Red/Green, who had appeared a hundred yards or so to the north-east of the territory which he occupied with the unringed female. He bred with all three females. The nests were

not found in the early stages of the breeding cycle in all cases, but the first egg was laid by the unringed bird about 9th April, by Orange/Blue on 22nd April and by his old mate, Red/Green, on or about 5th May. He was seen in courtship display with all three females and copulating with two of them. No other males were seen in the area at any time and the only other pair within half a mile occupied an extremely small territory some distance to the south.

Space does not permit a detailed description of the complete behaviour pattern of these four birds throughout the breeding season, but the following points are of greatest interest.

Between 10th and 22nd April, the male was simultaneously (1) escorting the unringed female, who was laying; (2) associating with Orange/Blue, four hundred yards to the south, in "false incubation" (page 215); and (3) engaging in desultory courtship with Red/Green a hundred and fifty yards to the east. All females at this time occasionally visited the area of his electricity pole observation post, although seldom more than one at a time. Each kept to her own territory, but there was a small irregularly shaped area of overlap, dictated by topography, around the base of the pole.

Later in this period, when the unringed female was incubating, the male would escort her off to feed and then, when she returned to the nest, he would go to the southern territory to sing on its perimeter and to escort the laying female Orange/Blue.

By 29th April, the unringed female's eggs had hatched and Orange/Blue was sitting. The male was devoting time to escorting the latter to feed, as well as to feeding the former's young. In addition, he was paying court more strongly to Red/Green, whose first egg was to be laid on or about 6th May. On 2nd May, the young in the unringed female's nest were taken by a predator and she retired from the scene. The male then divided his time equally between the two remaining females, commuting between the territories and behaving towards each female as he would have done if she had been his only mate. When passing from the feeding to the sitting female, he took the initiative in calling her off the nest. With so large a territory his defensive effect was necessarily somewhat incomplete, but distraction display was regularly resorted to if he happened to be present when an intruder appeared.

On 26th May the young left Orange/Blue's nest in the southern territory and the male was soon in attendance on the brood, at the same time helping Red/Green to feed her young which were still in the nest. Gradually, Orange/Blue's family party moved northward until, on 3rd June, they were on the edge of the territory occupied by Red/Green, whose young left the nest four days later. The family parties dispersed and all except the male and his old mate Red/Green had left

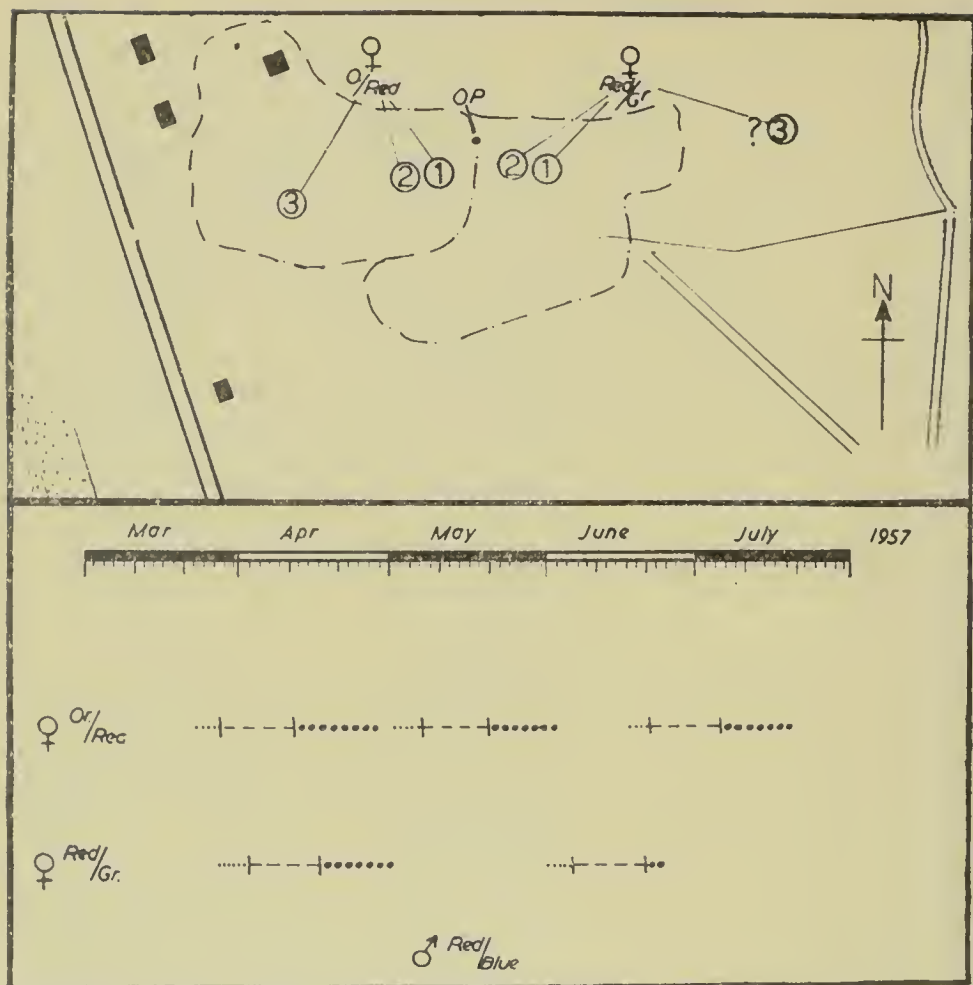


FIG. 2. Polygyny in the Stonechat (*Saxicola torquata*), St. Ouen's Bay, Jersey, Channel Islands, 1957. The territories concerned in the polygynous relationship between the male Red/Blue and two females, Orange/Red and Red/Green. The area consists of marram-covered wasteland bordering the sea. The horizontal side of the figure covers a distance of 500 yards. Nest-sites are represented by circles while the numbers are the brood numbers of the females concerned. Below the plan is a seasonal comparison of the stages in the breeding cycle reached by each female; in this the small dots, dashes and large dots represent laying, incubation and fledging periods respectively

the area by the end of June. The first egg of their second clutch was laid on or about 22nd June. They reared their second brood successfully in a nest one hundred yards south-west of the first, and remained together in the territory until it was taken over by a young male paired with a young female who had been ringed as a wanderer in September.

The third case of polygyny follows on from the second and took place in the following year, 1957, in part of the same territory (Fig. 2).

The young pair, the female ringed Orange/Red and the male later

ringed Black/Orange, remained in the territory throughout the winter. From 25th February the male was frequently seen in courtship display and this steadily gained in intensity until 5th March when the "chacking" and chasing continued even after dusk. The excitement was resumed on the morning of 6th March and at 0905 the male holding the territory was observed to be Red/Blue, a bird which had been ringed as a juvenile at the Jersey Bird Observatory half a mile to the south on 29th September in the previous autumn. The intensity of the courtship chase diminished thereafter, but the pair (now Red/Blue and Orange/Red) were still heard calling after dark until 12th March and they were seen in courtship display on 18th and 21st March. Their first egg was laid on or about 22nd March.

Meanwhile, on 15th March, the female Red/Green of the previous year had reappeared a hundred yards or so to the east. She was carrying nesting material and being escorted by the male (Red/Blue) on the 25th and her first egg was laid about two days later. From then onwards the behaviour pattern of the trio proceeded with almost textbook precision.

During the time that Orange/Red was incubating and Red/Green "false incubating", the male escorted each of them on their food sorties, calling them up from the nest in turn. The two females sometimes met on the boundary between their territories, but no animosity was ever shown as it would have been had they been females of monogamous pairs. The male chose a small hawthorn between the two nests for his observation post and gave warning, hid, or carried out distraction display, according to the demands of each type of intrusion.

Orange/Red's eggs hatched on 12th April and by the 15th the male was assisting her to feed the young, whilst still escorting Red/Green off the nest at the normal intervals. The latter's eggs hatched on the 16th and the male joined her in feeding the young two days later.

The male continued to divide his attention between the two females throughout the fledging period and after the young had left the nests. Then the two broods separated by a hundred yards or more and he commuted between them, chivvying the young, carrying out defensive action and defining the slightly changed boundaries of the territory. He paid a little more attention to Orange/Red than to Red/Green. The first egg of Orange/Red's second clutch was laid on 1st May, just four days after her first brood had left the nest. The male accompanied her off the nest during incubation, whilst escorting the young of the first brood. Red/Green and her brood left the area and she was not seen again until 26th May when Orange/Red's second brood were within a few days of leaving the nest. On that date, the male went through "false incubation" procedure with her, calling her out at intervals, whilst he assisted Orange/Red to feed at the nest. He sang

when Red/Green went to a place to which he chivvied her and on 29th May he copulated with her in an interval between carrying food to Orange/Red's nest. The first egg of her second clutch was laid the next day and she was later seen to be carrying lining material, escorted as far as the boundary of the territory by the male.

Orange/Red's second brood left the nest and her third clutch was laid whilst Red/Green was incubating. The male divided his attentions appropriately between them until Red/Green's young were taken by a predator on 22nd June. She then disappeared until 22nd July, leaving the male to give his undivided attention to Orange/Red.

When Red/Green returned to the territory after a month's absence, however, she was again escorted and courted by the male, who was by then wandering with Orange/Red's third brood. It is probable that Red/Green reached the "false incubation" stage of a third brood, but she went into moult and breeding activity declined throughout the territory in late July.

The trio remained in the territory until it was invaded by young of the year in late August. Orange/Red was seen with one of her own third brood, a male Two/Blue, on 28th August. It is believed that this male afterwards migrated for the winter, but he returned in the following spring and sired three broods out of his mother.

DISCUSSION

On the above evidence, it is clear that sexual dimorphism in the Stonechat is inseparable from the differences which exist between the active and conspicuous rôle of the male and the relatively passive and inconspicuous rôle of the female. It ensures pairing at the earliest possible age, as soon as juvenile plumage has served its function of concealment. The effect is minimal in winter, when territorial behaviour is at its lowest intensity and when both sexes primarily show their cryptic upper-parts.

At all other seasons the male assumes an attitude of physical dominance, his conspicuously patterned black, white and chestnut head, throat and breast enabling him to obtain a mate, court her and defend her and their territory with the minimum of physical effort. The dull coloration of the female, on the other hand, is adapted to her tasks of incubation and of brooding and feeding the young, with the maximum of concealment.

Whilst the Stonechat is normally paired at all seasons, except when actually migrating, it is not true to say that it pairs for life, as there are two periods in the annual cycle, in spring and autumn, when changes of mates may take place. The vernal relaxation of the pair-bond has already been discussed above. The autumnal relaxation, occurring at the time of greatest mortality amongst adults, serves to preserve the

vitality of pairs within a population and to establish pair relationships for the winter, again with the greatest economy of effort.

SUMMARY

(1) Stonechats (*Saxicola torquata*) pair after the assumption of first-winter plumage, and remain paired throughout the winter.

(2) The pair-bond is relaxed in spring for a very short period, at an advanced stage in sexual development, and changes of mates may take place.

(3) During the whole of the breeding cycle the rôle of the male is active and conspicuous and that of the female passive and inconspicuous. The male uses his advertisement patterning to defend the territory with the minimum of effort, whilst the female takes advantage of her cryptic coloration.

(4) Males may engage in polygynous relationships with two or more females and are able to adapt their behaviour to that of females in different stages of the breeding cycle.

(5) During and after the moult period, in autumn, mates may again be changed. This integrates new arrivals into the population.

(6) Stonechats tend to pair when they pause on passage in autumn.

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Movements and seasonal variation in mortality of Shags and Cormorants ringed on the Farne Islands, Northumberland

By J. C. Coulson

Department of Zoology, Durham Colleges in the University of Durham

INTRODUCTION

THE ECOLOGY OF the Shag (*Phalacrocorax aristotelis*) and the Cormorant (*Ph. carbo*) has been discussed by Lack (1945) as an example of closely related species which can co-exist in the same area. He showed that the two species had different nest-site preferences and that their food and probably their feeding areas were different.

In the present study, an analysis of the recoveries of Cormorants and Shags ringed on the Farne Islands, Northumberland, shows further ecological differences between the two species.



FIG. 1. Recoveries during the first year of life of Cormorants (*Phalacrocorax carbo*) ringed on the Farne Islands, Northumberland. Filled circles show recoveries between October and March inclusive; and crosses recoveries between April and September. The large open circle at Berwick-on-Tweed indicates 49 recoveries during the "winter" and two during the "summer". One recovery in Spain is omitted

METHODS

A total of 230 recoveries of Cormorants and 127 of Shags ringed on the Farne Islands form the basis of this study. Those of birds ringed up to and including 1959 and recovered before 1st October 1960 have been used. There is therefore a bias, in that proportionately more first-year birds are included, but since ring loss occurs in both species (Kortlandt 1942, Coulson and White 1957), such a bias already exists. Because of this, no attempt has been made to estimate the annual mortality rate from the ringing recoveries, but it has been shown that the adult mortality of both species is very low (Kortlandt; Coulson and White), while the first-year mortality is probably very high (Stuart 1948, Coulson and White).

All Cormorant recoveries and the great majority of those of the Shag are of birds ringed as nestlings. Subsequent recaptures and recoveries of these ringed birds suggest that most individuals which survive to breed, do so in their natal area.

The Cormorants and Shags nest within a mile of each other on the Farne group, but on different islands. Thus their movements, if they behave in a similar manner, can be expected to be influenced equally by topographical factors. If differences occur in the movements of the two species, they can be regarded as indicating differences in their ecology.

All differences have been examined statistically. The significances have been determined by calculating χ^2 from contingency tables after applying Yates's correction.



FIG. 2. Recoveries after the first year of life of Cormorants (*Phalacrocorax carbo*) ringed on the Farne Islands, Northumberland. Symbols as in Fig. 1. The large open circle at Berwick-on-Tweed indicates seven recoveries during the "winter" and 12 during the "summer". One recovery in south-west France and one in Spain are omitted

BRITISH BIRDS

TABLE 1—RECOVERIES OF CORMORANTS (*Phalacrocorax carbo*) AND SHAGS (*Ph. aristotelis*) NORTH OR SOUTH OF THE FARNE ISLANDS, NORTHUMBERLAND, IRRESPECTIVE OF LONGITUDE

		First-winter		First-summer		After first-summer	
		No.	Percentage	No.	Percentage	No.	Percentage
Cormorant	North	94	63.5%	10	40%	38	56%
	South	54	36.5%	15	60%	19	44%
Shag	North	25	29%	18	78%	10	55.5%
	South	61	71%	5	22%	8	44.5%

MOVEMENTS

The records have been grouped according to whether the birds were recovered in their first year or later and whether they were recovered between October and March inclusive (subsequently referred to as "winter") or between April and September ("summer"). The recoveries are shown in Figs. 1 and 2 for the Cormorants and Figs. 3 and 4 for the Shags, dots indicating "winter" ones and crosses birds recovered in the "summer".

1. *Movements of first-year and older birds*

In both the Cormorant and the Shag, the movements in the first winter are greater than those which occur in subsequent winters. This is particularly evident in the Shag (Figs. 3 and 4) where there are only two recoveries of birds over one year old beyond Northumberland and Berwickshire.

The percentages of first-winter, first-summer and older Shags and Cormorants which were recovered north or south of the Farne Islands are shown in Table 1. It is evident that more first-winter Cormorants are recovered to the north of the Farnes, while more Shags of the same age are recovered to the south ($P < .01$). In the first summer the position is reversed; more Cormorants are recovered south of the Farnes and more Shags to the north ($P < .01$).

The above conclusion takes no account of the actual distances moved. First-winter Cormorants move north only as far as the Aberdeenshire coast, but Shags of a similar age penetrate north to the Shetlands. First-winter Cormorants move farther south than Shags, reaching the Atlantic coast of France and, in two instances, Spain; Shags reach only the latitude of the south coast of England.

Thus the Shags disperse almost as far north as they do south during the first winter, but the Cormorants may move about three times as far south as north.

2. Migration

There is no evidence of a true migration in the Shag. First-winter and first-summer birds disperse along the coastline. The fact that there are so few Shags recovered on the Continental side of the North Sea is good evidence that this dispersion is merely coastal and not radial.

First-winter and first-summer Cormorants also show a marked dispersion which, like that of the Shags, is also coastal (there are no recoveries on the Continental side of the North Sea). However, the recoveries of Cormorants in France and particularly Spain may indicate a true migration by some individuals. It is worth drawing attention to the fact that no Farne Islands Cormorant ringed since 1914 has been recovered in Spain and this is in marked contrast with the behaviour of Cormorants ringed at Mochrum in Wigtownshire (Stuart 1948), where 8% of the recoveries were from that country. Further, only nine (4%) of the Farne Islands Cormorant recoveries have been from France and Spain, whereas 35 (21%) of the Mochrum-ringed birds were from that area. This difference is significant ($P < .01$).

Thus, while these two Cormorant colonies are at about the same latitude, there is a marked difference in their behaviour. There is some evidence that this migratory behaviour was originally present in some of the Farne Islands population but has since been reduced or lost, while it has persisted in the Mochrum colony up to at least 1939. It is well established that populations within a species may vary in the presence or absence of migratory behaviour.

3. Recovery at Berwick-on-Tweed

Berwick-on-Tweed lies about 17 miles north-west of the Farne Islands and both Cormorants and Shags are shot in that area because of a reward scheme offered by the River Tweed Commissioners. Table 2 shows the records of birds ringed on the Farne Islands and recovered in the estuarine areas near Berwick-on-Tweed, and these indicate that there is a considerably higher proportion of Cormorants recovered in the Tweed region ($P < .001$).

TABLE 2—RECOVERIES OF CORMORANTS (*Phalacrocorax carbo*) AND SHAGS (*Ph. aristotelis*) AT BERWICK-ON-TWEED, NORTHUMBERLAND

	First-winter		First-summer		After first-summer	
	No.	Percentage	No.	Percentage	No.	Percentage
Cormorant	49	33%	2	8%	19	33%
Shag	2	2%	0	0%	2	11%

BRITISH BIRDS

TABLE 3—RECOVERIES OF CORMORANTS (*Phalacrocorax carbo*) AND SHAGS (*Ph. aristotelis*) INLAND

	First-winter		First-summer		After first-summer	
	No.	Percentage	No.	Percentage	No.	Percentage
Cormorant	26	18%	2	8%	7	12%
Shag	21	24%	0	0%	0	0%

4. Occurrence inland

The numbers of Cormorants and Shags recovered inland are shown in Table 3. There is no significance between the proportions of first-winter Cormorants and Shags recovered inland. There is, however, a marked difference in the inland areas involved. Of a total of 21 inland



FIG. 3. Recoveries during the first year of life of Shags (*Phalacrocorax aristotelis*) ringed on the Farne Islands, Northumberland. Symbols as in Fig. 1



FIG. 4. Recoveries after the first year of life of Shags (*Phalacrocorax aristotelis*) ringed on the Farne Islands, Northumberland. Symbols as in Fig. 1

recoveries of Shags, 20 were from south-east England (Fig. 3), but only eight out of 26 inland records of first-winter Cormorants were from this region. After the first winter, there are no records of Shags recovered inland, but there are nine recoveries of Cormorants.

The reason for the first-winter Shags being recovered inland predominantly in south-east England is not obvious. However, the recovery details of one individual in the Norfolk Broads may suggest a possible cause. This bird, 101.4477, repeatedly roosted on the roof of a bungalow before ultimately being found dead. It is possible that Shags have difficulty in finding suitable roosting sites on the low, flat coast-line of East Anglia. They usually roost on cliffs on rocky coasts and do not normally roost on the sea. Shags seeking places to roost in south-east England may have to choose sites which are washed by heavy seas (e.g. sand banks) and, should they be disturbed at night, they may inadvertently fly inland over the low coast-

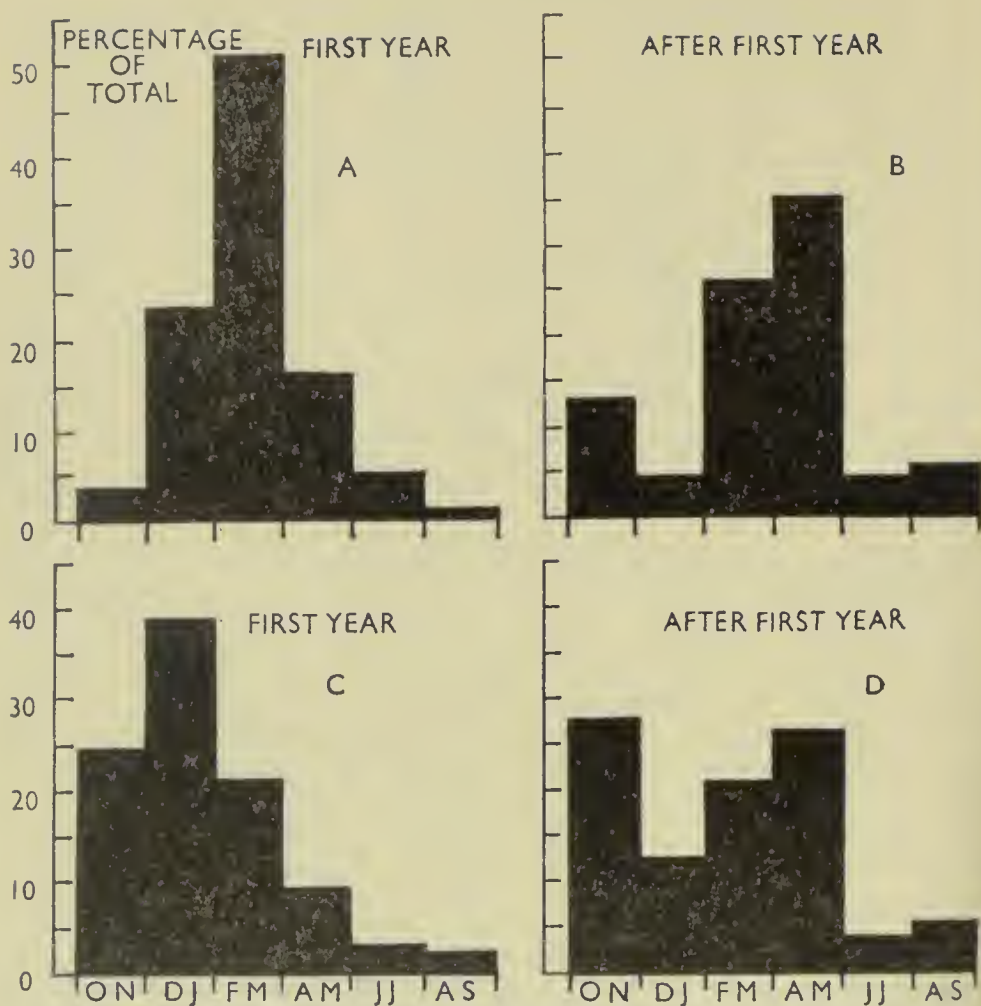


FIG. 5. The bi-monthly recoveries of Cormorants (*Phalacrocorax carbo*) and Shags (*Ph. aristotelis*) expressed as percentages of the total: (A) first-year Shags, (B) older Shags, (C) first-year Cormorants and (D) older Cormorants

line. Observations on the roosting habits of Shags in south-east England are required to test this hypothesis.

5. Seasonal variation in the time of recovery

The percentages of the total recoveries occurring in each month of the year are shown in Fig. 5. There is a marked difference in the time of the peak of mortality of first-winter Cormorants and Shags; the former reach a peak in December and January and the latter in February and March. This difference in the time of mortality is significant ($P < .01$). These peaks are not as pronounced in the older birds, but there is still a suggestion that mortality in the Cormorant tends to occur earlier than it does in the Shag.

DISCUSSION

From a study of both Passerine and non-Passerine birds, Lack (1944, 1945) described three types of distribution of pairs of closely related species (it is obvious from Lack's examples that he has regarded "closely related species" as synonymous with "members of the same genus"). These types are:

- (1) where the geographical ranges of the two species do not overlap and in some instances their distribution is complementary over their combined ranges;
- (2) where the two species exist in the same geographical area but differ in their habitats or food;
- (3) where the two species exist in the same geographical area and the same habitat and utilise the same food.

Lack contended that the first two types supported Gause's hypothesis* and suggested that the third group contained examples which could probably be shown to belong to the second group if more ecological information were available.

Gause never published a generalisation of his laboratory studies and later workers have formulated definitions based on his work. Thus Lack (1945), in a paper dealing with the ecology of the Cormorant and Shag, defined Gause's hypothesis as ". . . two species with similar ecology cannot live in the same area. . . ." Gilbert *et al.* (1952) commented on this and other definitions used by Lack and stressed the need for the inclusion of the reservation that the two species must be in competition for a common requisite (such as food or breeding sites). While Lack failed to include this reservation in any of his definitions, it is clear from his writings that he fully appreciated the limitation of the hypothesis. Once the need for competition is included in the definition, Gause's hypothesis is both logically and mathematically sound; but unless the two species which have similar ecology are in competition, there is no reason why they should not permanently co-exist.

Both Lack (1945) and the present paper have presented data which show that there are a number of ecological differences between the Cormorant and Shag. Lack maintained that the differences which he described fully substantiated Gause's hypothesis, but this claim requires critical examination. It is possible to explain the differences in the ecology of two closely related species on the basis of competition and Gause's hypothesis, but this alone does not *prove* that the differences were actually the product of competition.

Most bird species have probably arisen by geographical rather than ecological isolation and since no two geographical areas are identical,

*Udvardy (1959) has shown that this concept was first put forward by Grinnell (1904) some 30 years before Gause published his experimental data.

it is conceivable that observed ecological differences between two closely related species arose as adaptations to the physical conditions of their respective ranges. Later, when one or the other species changed its range and they overlapped, it could be expected that the ecological differences would persist.

In the case of the Cormorant and Shag, it is necessary to take into consideration their taxonomic relationship. These two species have not evolved directly from a common parent stock; their common ancestor is probably much further removed. Therefore, there has been considerable time (in the evolutionary sense) for differences to have arisen by means other than competition. The importance of this point can be stressed by taking an example from another group of birds, say the genus *Larus*. It would be difficult to support a suggestion that the differences in the ecology (and even size) of the Herring Gull (*Larus argentatus*) and the Black-headed Gull (*L. ridibundus*) were the result of competition between the two species. Yet essentially this very suggestion has been made for the Shag and Cormorant.

Undoubtedly competition has been responsible for some of the differences which have occurred between closely related species of birds, but the extent of this influence has not been established. It is unlikely that two species could compete for more than one requisite at any one time. Thus competition is likely to alter only one ecological factor (and associated behaviour) at a time. For example, in the case of the Cormorant and Shag, they *may* have once been in competition for food, but it seems unlikely that they were in competition for nesting-sites at the same time. If these differences were produced by competition, they were probably in competition on two or more occasions. This limitation does not apply to ecological differences produced while the two species were geographically isolated, since more than one difference can be selected simultaneously by natural selection.

It has been the aim in this discussion to draw attention to the concept of Gause's hypothesis, and to suggest that at least one example which has been cited in support of the idea is perhaps not as convincing as it has been claimed.

ACKNOWLEDGEMENTS

I wish to thank Professor J. B. Cragg for helpful discussions during the preparation of this paper and also for reading the manuscript. I am also most grateful to Mrs. G. Hickling for making available the ringing recoveries of Shags and Cormorants ringed on the Farne Islands.

SUMMARY

An analysis of the ringing recoveries of 230 Cormorants (*Phalacrocorax carbo*) and 127 Shags (*Pb. aristotelis*) ringed on the Farne Islands, Northumberland, has shown



PLATE 35. Dark-phase Elconora's Falcon (*Falco eleonorae*), Mogador, August 1959. This falcon is dimorphic, about one in four being dark. A few of these are black, but most are dark brown like this, with faintly streaked breast, barred undertail and no moustache (cf. plate 39c). The species is crepuscular; it is a summer visitor to islands between the Canaries and Cyprus, where it nests in autumn to feed its young on migrant birds (page 236) (photo: Richard Vaughan)



PLATE 36. Above, uninhabited islet off Ibiza, Balearics, July 1954, typical of the Mediterranean breeding sites of Eleonora's Falcon (*Falco eleonora*). Inset, flight-silhouette, showing the long tail and wings (page 236). Below, three light birds: colonies are of two to 100 pairs (page 236) (photos: Richard Vaughan)





PLATE 37. Two dark/light pairs of Eleonora's Falcons (*Falco eleonorae*) at cliff nests, with Rock Doves (*Columba livia*) below, Mogador, August 1959. On the left a light female is brooding above her mate, while the other two have young in a nest on the sandy ledge between them (cf. plate 38) (photo: Richard Vaughan)

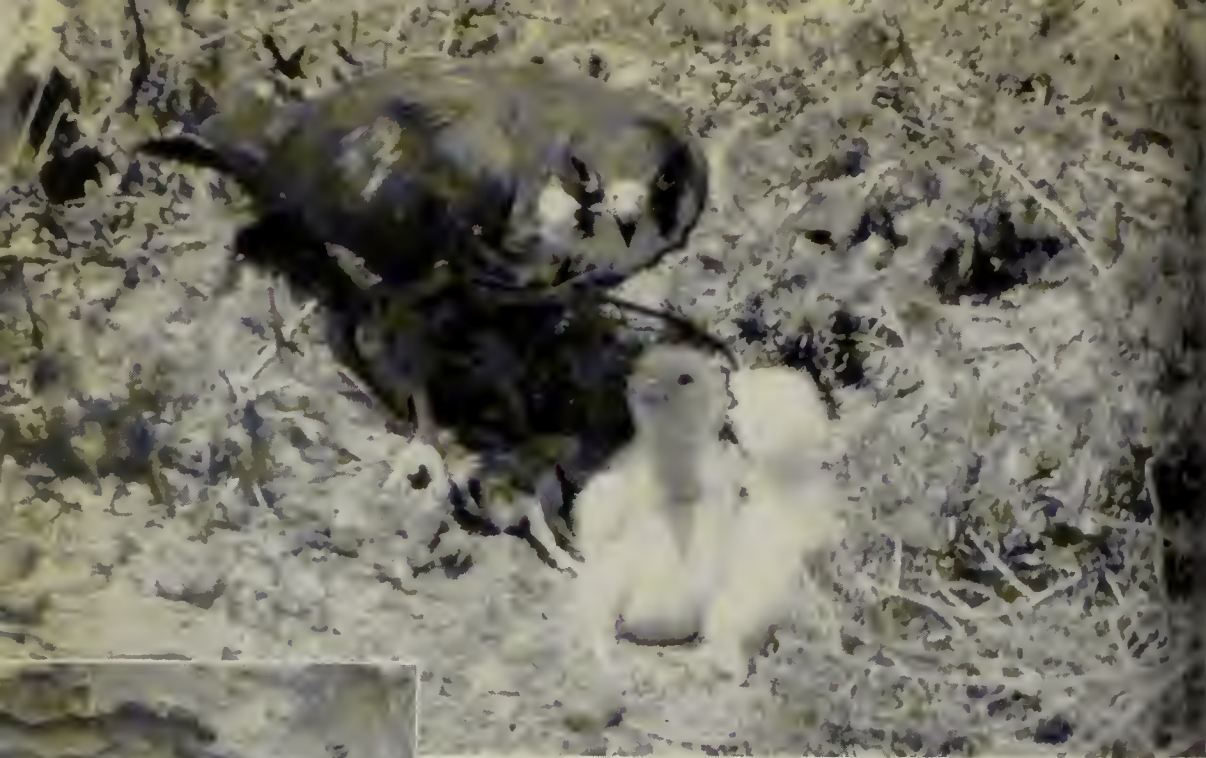


PLATE 38. Eleonora's Falcon (*Falco eleonora*), Mogador, August 1959. Nests were scattered along the cliff top and on ledges below (*cf.* plate 37); left, a rock-sheltered nest on a slope; top and bottom, an open nest on flat ground. Two to four eggs are normal. Chicks seven days old (*top*) are surrounded by prey remains and feathers, but until the eggs hatch (*bottom*) the nest is clean; this female is raising her feathers to keep herself cool

PLATE 39 (*facing*). Upper, a light female (males are slighter, with smaller bills); note wings level with tail tip. Lower, dark and light compared; the latter is creamy-buff below with heavy black streaks and, Hobby-like, has rufous thighs and undertail (page 237 and *cf.* plate 35) (*photos: Richard Vaughan*)









PLATES 40 and 41. Redpolls (*Carduelis flammea*) feeding young (different nests), Inverness-shire, May 1959. The pair at the nest on the left showed all the characters of the Greenland race (*rostrata*), including large size, heavy bill and strongly marked flanks, while the nest itself was also unusual (pages 251-253). Above, typical British Lesser Redpoll (*disruptis*) and nest (photos: S. C. Porter)



PLATE 42A. Dead Sand Martin (*Riparia riparia*) trapped by hooked bracts of burdock heads, Northamptonshire, September 1960 (page 246) (photo: F. A. Adams)

PLATE 42B. Multiple nest of Great Tit (*Parus major*), Surrey, 1934; the cups correspond with side holes in the covering pot (page 247) (photo: W. E. China)



the following ecological differences between the two species and also between age groups:

- (1) In both species, the young birds disperse further than the adults.
- (2) The young Shags tend to move south of the Farne Islands in the winter and north of them in the summer; a reverse trend is found in the Cormorants, where there is a tendency to move north in the winter and south in the summer.
- (3) There is no true migration of the Shags; a true migration may occur in some Cormorants, but this ability has apparently been lost by most of the Farne Islands population although it has been observed in a colony in Wigtownshire.
- (4) Considerably more Cormorants than Shags are recovered at Berwick-on-Tweed, Northumberland, an estuarine area, where there is considerable shooting pressure.
- (5) Both species occur inland during their first winter (but not subsequently in the case of the Shags); the inland recoveries of the Shags are almost exclusively from south-east England, while the Cormorants are more scattered.
- (6) The peak of recovery of first-year Cormorants occurs before that of first-year Shags; there is a suggestion of the same difference in older birds.

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Studies of less familiar birds

III. Eleonora's Falcon

By Richard Vaughan

Photographs by Richard Vaughan and Oliver Carruthers

(Plates 35-39)

IT IS PERHAPS hardly surprising that Eleonora's Falcon (*Falco eleonorae*) was one of the last European birds to be discovered and described, and that it was not photographed successfully until these pictures were taken in 1959. The total world population is probably

rather less than 4,000 birds, and is sparsely distributed in the breeding season on uninhabited islets (plate 36a) and inaccessible cliffs (plate 37) between the eastern Canaries and Cyprus. Because of this, no doubt, knowledge of this bird has been limited and sometimes inaccurate. In the *Field Guide*, for instance, it is said to be "mainly resident", whereas in fact it is a summer visitor to its breeding range and has never been recorded in the winter months outside Madagascar and the Mascarenes; its cere, which varies between pale lemon and white, is said to be yellow; the one really diagnostic field character, the long tail, which is particularly noticeable in flight (plate 36a, inset), is not mentioned; and the statement that it feeds mainly on small birds is only known to be true of August, September and October, for insects certainly predominate in spring and early summer, and probably also in winter. These remarks are not made in a critical spirit, but simply to illustrate the inadequacy of our knowledge of this interesting species.

Eleonora's Falcon breeds in colonies (plates 36b and 37) varying in size from two pairs to a hundred or more. Apart from a concentration in the Aegean extending south to the north coast of Crete, where about half the total population breeds, the colonies are widely scattered: 800 miles separate those on the north-west African coast from their nearest neighbours in the Balearics, and the small colony on Lampione is more than 100 miles from any other. On the other hand, since the Rev. John White's "Hobbies" which bred in his time on the rock of Gibraltar were almost certainly Eleonora's Falcons, and since the species bred on the Îles d'Hyères in the seventeenth century, we may surmise that it was formerly more thickly distributed, at least in the Mediterranean.

Birds begin to arrive at their breeding colonies in the last week of April and may be seen there throughout the summer, though the two to four eggs are not laid before mid-July. No nest is made, and the eggs are deposited within about thirty yards of the sea, either in a crevice or on an open ledge on a cliff (plate 37); in the open on top of a cliff, within a yard of the edge (plate 38c); in vertical "pot-holes" on the tops of large boulders below cliffs; or on a steep cliff-slope, where they are usually partly sheltered by rock (plate 38b) or scrub.

The very late breeding-season of Eleonora's Falcon coincides almost exactly with the passage of autumn migrants through the breeding range, and the young falcons, which hatch from mid-August on and fly in the last week of September and early October, are fed almost exclusively on small Passerine migrants. This fact was strikingly illustrated at Mogador in 1959, where Mr. Oliver Carruthers and I identified the remains of some 250 individual birds killed by the falcons, for all save five of these were migrants. In August and September

Eleonora's Falcons kill far more birds than they actually need and "larders" are formed near the nests soon after the young have hatched; these are usually sited in a niche in the rock or under a bush and into them the bodies or remains of small birds are neatly stacked, tails outwards. Sometimes the corpses are untouched; sometimes they are decapitated or partly plucked; frequently only the hind parts with tail and legs attached are placed in the "larder". Prey remains are also found scattered about all over the breeding area. The utility of Eleonora's Falcon for the student of migration should not be scorned, for it not only provides material for the specific identification of such difficult warblers as *Hippolais* and *Phylloscopus*, but also kills species which one would not normally expect to see. Thus at one central Aegean colony my wife and I found the remains of a Little Crake (*Porzana parva*); and the evidence for the autumn migration of the Grasshopper Warbler (*Locustella naevia*) down the north-west African coast consists of seven corpses found by us at Mogador in 1959 and one recovered by Dr. H. B. Cott from an Eleonora's Falcon colony in the Canaries in 1931.

Eleonora's Falcon is dimorphic, about one in four individuals being of the very distinctive dark form (plate 35). The plumage of this form varies somewhat, but most individuals are dark brown, more or less uniform save on the breast, which is flecked or streaked with lighter brown (plate 39b). A few dark birds are uniform coal-black all over, while a few have the moustachial stripe faintly adumbrated and show some rufous on the thighs and under tail-coverts. The light form has dark brown or slate upper-parts, and the cream to buff breast is more or less heavily streaked with black (plate 39c). The lower belly, thighs, and under tail-coverts are rich rufous or chestnut. Often the upper breast is finely streaked, but the lower breast is invariably broadly streaked, and in general the under-parts are much darker than those of the Hobby (*F. subbuteo*), so that even light-phase individuals often look wholly dark from a distance, except for the white cheek. Intermediate forms are rare. The dark phase shows clearly in juvenile plumage. The average difference in wing-length of about a centimetre is insufficient to distinguish the sexes of Eleonora's Falcon in the field, but at close range the female's more powerful build, especially about the head and bill, is noticeable. Eleonora's Falcon is similar in size to, but more slender in build than, the Peregrine (*F. peregrinus*). The tips of its long wings and tail lie level when the bird is perched (plate 39a). It stoops like a Peregrine, hawks for insects like a Hobby, and even hovers like a Kestrel (*F. tinnunculus*) with tail outspread. Its usual call is a rather harsh *kyā kyā kyā kyā*, and this is excitedly repeated when a breeding colony is approached and the birds are put off their nests.

Eleonora's Falcon seems to be even more crepuscular than the Red-footed Falcon (*F. vespertinus*), and this is specially so in the breeding season, when Passerine migrants form the staple diet. One of the most characteristic sights at a breeding colony is the evening exodus of birds to their feeding areas, which may be at least six or seven miles away from the colony. During a fortnight's stay at the large colony off Mogador, we never saw a falcon carrying prey, yet on one occasion two Swifts (*Apus apus*) and two Nightingales (*Luscinia megarhynchos*) were brought in between 6.30 p.m. and 8.0 a.m. at a nest which we were observing during the daytime.

A word should perhaps be said in conclusion about the species most nearly related to Eleonora's Falcon, the Hobby and Sooty Falcon (*F. concolor*). The plumage of the Hobby is similar to that of the light phase of Eleonora's Falcon; like Eleonora's it is a summer visitor, and it breeds late, though not so late as Eleonora's. The Sooty Falcon is much nearer Eleonora's. It breeds colonially at the same time of year on islets in the Red Sea, and its habits appear to be very similar. Its plumage is interesting, for both sexes are a uniform ash grey all over, and a dark phase occurs, but the young (at any rate of the light phase) have the light, streaked under-parts and moustachial stripe of young Hobbies, Peregrines and light-phase Eleonora's Falcons, a plumage pattern which perhaps approximates to that of the common ancestor of all these species.

A much fuller account of the characters, habits, food, breeding, distribution, numbers and migration of Eleonora's Falcon will be found in *Ibis*, 103a: 114-128.

The taxonomy of the redpolls

By *Kenneth Williamson*

Migration Research Officer, B.T.O.

CURRENTLY MOST TAXONOMISTS divide the redpolls into two species, the high-arctic *Carduelis hornemanni* and the low-arctic, sub-arctic and temperate zone *C. flammea*. The correctness of this treatment is a matter for disputation (Salomonsen 1928), and in many respects it would be more satisfactory to regard the whole group as conspecific.

There are two high-arctic forms, the large and extremely pale *hornemanni* inhabiting the more northern fell-slopes of Greenland on both the east and west coasts (and for the most part wintering in that country); and the smaller but otherwise very similar Hoary or Coues's Redpoll, *exilipes*, with a Holarctic distribution across northern Canada, Alaska, Siberia and northern Russia to Lapland. The other group

contains the Mealy Redpoll, *flammea*, with a Holarctic distribution south of the range of *exilipes*; the Lesser Redpolls with a disjunct distribution in the mountains of south-central Europe (*cabaret*) and the British Isles (*disruptis*); the low-arctic Greenland or Greater Redpoll, *rostrata*, in southern Greenland and Baffin Island; and an interesting sub-arctic form *islandica* in Iceland, about which more is said below. In northern Norway the population is neither true *flammea* nor true *exilipes*, but shows characters linking the two (Payn 1947); this has been named *pallescens* and is sometimes put with the high-arctic and sometimes with the other "species". Descriptions of Hornemann's, Coues's, Mealy, Greenland and British Lesser Redpolls can be found in *The Handbook* (I: 66-74) and it is not proposed to repeat them here.

When the several groups are examined in series in the museum, taking birds of the same age and season, there are seen to be slight but fairly constant differences between the Old and New World populations. Thus, American Mealties tend to be darker on the mantle and more prominently streaked on the flanks than European, and indeed these characters find their strongest expression in the low-arctic Greenland population *rostrata*, which also has a heavier and more bulging bill. There can be little doubt that this redpoll has invaded southern Greenland from the west. The American Hoary or Coues's Redpolls tend to have warmer buff fringes on the upper-parts than Eurasian *exilipes* in fresh autumn dress, though the two are inseparable in spring; they are, moreover, more consistently immaculate in the whiteness of the rump.

A further important point is that whilst Mealy and Hoary Redpolls occur in some parts of arctic America as a mixed population, there is apparently no evidence of interbreeding and the indications are that they behave as good species; but in parts of Eurasia in addition to N. Norway there is clearly some intergradation between the two, so that their relationship seems to be more that of conjunct subspecies. This fact was already clear to Dresser (1871-81), who had difficulty in assigning birds collected on the Pechora by Seeborn and Harvie-Brown to either *flammea* or *exilipes*, "for they resemble the latter in form and measurements, but have the rump more or less striped and not white". There are a number of specimens from redpoll invasion-years (especially 1910) in the British and Royal Scottish Museums, from Fair Isle south to Norfolk, which one cannot place with confidence in either "species", and for which *pallescens* exists as a convenient niche (some, examined by the late Dr. C. B. Ticehurst, have the despairing note "bastard *linaria* × *exilipes*" scrawled on the labels!). Similarly, there are birds from wintering areas in the U.S.S.R. (Pskov, Moscow, Krasnoyarsk) which have mantles similar to Mealy or a little paler, but show the clear white rumps of the *pallescens* type. When in

Lapland in March 1938, Col. R. Meinertzhagen collected a series from localities about 180 miles north of the Arctic Circle; his view that they are better called *pallescens* than *exilipes* is understandable when one compares them with topo-typical *exilipes* from arctic America.

This *pallescens* type is not the only evidence of apparent hybridisation. As pointed out by Salomonsen (1928, 1951), the Icelandic population has all the appearances of a "hybrid swarm". I have notes made some years ago on about twenty Iceland Redpolls kindly lent to me by Dr. Salomonsen from the Universitetets Zoologiske Museum, Copenhagen; these birds, taken in two localities, Sydra-Mylasysla and Sydru-Thingeyars'sla, in the second half of September 1906, run the gamut of variation from near-*rostrata* to near-*hornemanni*, the latter having "creamy-white streaking on mantle very pronounced" and the rumps either immaculate or "with very faint streaks", with in one or two cases the white extending on to the lower back. Bird (1935), noting the paleness of many Icelandic birds, suspected that these were winter immigrants of *exilipes* from Europe. True *hornemanni* very rarely visits Iceland.

In so far as one can generalise about *islandica*, it is usually similar above to the Mealy Redpoll, being a brighter and warmer brown with paler fringes than *rostrata*, with the rump whiter than in that form, but it tends towards *rostrata* in its more pronounced flank-streaking and the heavier bill.

Possibly *hornemanni* was the breeding form in Iceland in an earlier, colder epoch, and with an amelioration of climate the low-arctic form (which is strongly migratory) colonised Iceland from the south-west faster than *hornemanni* could withdraw, a variable hybrid population resulting. A reflection of this is to be seen today in the situation engendered by the recent climatic improvement in west Greenland. Salomonsen (1951) gives evidence that up to the end of the last century Hornemann's Redpoll was the breeding bird of Umanaq and Upernavik Districts where *rostrata* was unknown; he visited Upernavik in 1936, finding *rostrata* abundant and *hornemanni* reduced to a very local bird. He records how interbreeding was taking place at a mixed colony at Orpik, a pair collected *in cop.* proving to be ♂ *rostrata* and ♀ *hornemanni*. He adds, "I failed to find any difference between the two forms in general behaviour, song and other notes". Wynne-Edwards (1952) reached the same conclusion with regard to a mixed population at Clyde Inlet, Baffin Island, where the only isolating mechanism appeared to be the later arrival of *rostrata* a fortnight after mating was first witnessed in the high-arctic form.

With regard to the recent breeding of a north-western type of redpoll in Scotland (pages 251-253 and plate 40), it can be said that the photographs taken at the nest, and the description of the birds, rule out the

possibility of their being typical *islandica* or individuals of that population verging towards the *hornemanni* type. Only a small minority of Iceland Redpolls are so dark on mantle and rump as to be virtually inseparable from the Greenland *rostrata*. Moreover, *islandica* is almost a sedentary form (which is what one would expect if the original stock was of *hornemanni* type) and, although I have examined many immigrant redpolls from the Outer and Inner Hebrides, Mull, Argyll and Fair Isle in various collections, only two came close to the paler specimens of *islandica* and were possibly that race, while a few others were indeterminate. The great majority (including those referred to *islandica* by Ticehurst 1924), are quite characteristic of *rostrata*, and it is this form which, in addition to wintering in Iceland, enters north and west Scotland as an autumn migrant, in some years in considerable numbers (Williamson 1956, Davis 1960). Thus, whilst there cannot be absolute certainty, there is extremely high probability that the Scottish breeding pair belonged to the Greenland low-arctic form.

So far as the problem of speciation is concerned, one must conclude that, as pointed out by Wynne-Edwards (1952), the two groups of redpolls are sympatric over a wide area of North America and do not apparently interbreed. In parts of Europe, however, climatic factors have apparently intervened to break down the barrier to interbreeding. Over much of Europe and Asia this may affect only individuals, perhaps more particularly in late arctic springs when *exilipes* is forced to breed farther south than usual; but in Iceland certainly, and north Norway probably, the isolating factor has broken down at the population level, so that in Europe the two groups are at best only subspecifically distinct.

My thanks are due to Dr. Finn Salomonsen for reading through the paper in draft.

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Notes

Manx Shearwater nestling still unfledged in late November.—On 28th November 1960 Mr. W. Evans, a farmer on Bardsey Island, Caernarvonshire, discovered a young Manx Shearwater (*Procellaria puffinus*) in one of his fields where many of these birds had nested earlier in the year. It was in the afternoon that he picked it up and examined it, and he described it to me the same evening. It was unable to fly and still downy, although the feathers were growing well. It was apparently in good condition and did not seem to be injured in any way or undernourished. As there was a chance that the adults might still be fighting in to feed it, I spent some time in the field concerned later that night. However, I did not hear the calls of any Manx Shearwaters and a thorough search the following day failed to reveal the chick. Nevertheless, although I did not see any shearwaters off Bardsey during my visit from 19th November until 1st December, I have no reason to doubt Mr. Evans's word since he has lived there for many years with the birds breeding in large numbers.

The Handbook states that in the British Isles the Manx Shearwater lays between early May and the first half of June. The egg from which this late November youngster came must have been laid about the first week of August.

IAN M. WALKER

[We have discussed this record with several other observers who know Mr. Evans and the circumstances of his discovery. These people include R. W. Arthur, warden of the bird observatory on Bardsey in 1960, and Mrs. J. B. Cowdy. All support the record. We also asked Peter Davis to comment in view of his great experience of Manx Shearwaters on Skokholm, Pembrokeshire, during 1954-56. He wrote, "I was never on Skokholm after 1st November (except for odd day trips), but we were quite often out at night until the end of October. We never saw a young shearwater after about 15th October and any that month generally looked rather retarded and dejected. As to the adults, we seldom noted them, even out at sea, after the first week of October. The work of Pauline Ralphs (*Skokholm Bird Observatory Report for 1955*, pp. 20-22) confirmed the desertion of chicks before they are fledged, but her longest desertion period was only eighteen days and that was something of an exception since the next longest was thirteen. Some late chicks may perhaps be deserted rather longer than this, judging by their weak condition when they finally emerge, but if the one on Bardsey was in even reasonably good shape it must have been fed until almost mid-November. Incidentally, I have no evidence that Manx Shearwaters ever lay replacements, and

so it seems unlikely that a lost egg or chick could have been the cause of a laying as late as August.”—Eds.]

Kestrel taking Kentish Plover.—Recently (*Brit. Birds*, 53: 573) a female Kestrel (*Falco tinnunculus*) was recorded taking a Turnstone (*Arenaria interpres*). On 7th June 1952, R. W. Crowe and I saw a male Kestrel capture an adult Kentish Plover (*Charadrius alexandrinus*) which was feeding on the shore of the Slufter, on Texel in the Netherlands. Our attention was drawn by the sudden, vociferous alarm-notes of Redshanks (*Tringa totanus*). The Kestrel rose with considerable difficulty, the struggling plover in its talons, and slowly made off to a point in the sand dunes about half a mile away, where it was lost to view.

K. E. L. SIMMONS

Great Black-backed Gull attacking Coot.—In the winter of 1957 I saw a flock of sixty or seventy Coots (*Fulica atra*) disturbed by a boat at Abberton Reservoir, Essex. They flew upwind in scattered formation at a height of thirty-five or forty feet and then, approaching a causeway, turned downwind to head back to open water. Just as they turned, a Great Black-backed Gull (*Larus marinus*) came downwind over the causeway, some ten or fifteen feet higher in the air than they were. In a very creditable “stoop”, the gull went straight through the flying Coots and seized one by the neck in full flight with the greatest of ease. An aerial struggle took place, the Coot kicking and flapping with all its might. The gull stalled and was forced to drop its victim about thirty feet into the water, but it dived after it at once. The Coot was still full of fight and, when the gull hovered overhead, it jumped up out of the water at its attacker; when the latter settled on the water two or three feet away, the victim adopted the well-known hostile attitude with wings raised and neck stretched out. This went on for about five minutes, but all the time the Coot was edging back to the reassembled flock, until finally it made a sudden quick rush and attained safety in the dense pack. The gull then flew off.

R. V. A. MARSHALL

Lesser Black-backed Gulls day-roosting for long periods in trees. For many years small parties of adult Lesser Black-backed Gulls (*Larus fuscus*)—presumably non-breeding birds—have been present at Saltford, Somerset, during the summer months. Since 1959 I have noticed up to four day-roosting for long periods on an ash and two oaks which are to be seen from my garden. They use both vertical and horizontal perches—dead boughs protruding from otherwise leafy trees—approximately twenty-five feet above the ground. The vertical perches are three to five inches thick and the gulls make use of

convenient clefts or notches; some of the horizontal perches are also only a few inches thick. If undisturbed, the birds are content to remain on the same perches for much of the day and I have timed individuals for up to six hours. A number of other trees in the vicinity, including other ashes and oaks, seem to possess suitable roosting places, but so far only the three trees have been used.

J. A. G. Barnes and W. G. Teagle reported isolated records of single Lesser Black-backed Gulls roosting in trees (*Brit. Birds*, 41: 126; 42: 64), and I have once seen an adult perched on a nine-inch thick horizontal bough on a Scots pine at Chew Valley Reservoir, Somerset, where a colony of thirty to fifty pairs of these birds now breed, but I can trace no other observations of daily roosting in trees as happens at Saltford.

BERNARD KING

Unusual nest-sites of Herring Gulls in Cornwall, including a tree and various buildings.—On 16th June 1959 I visited the grounds of Porthpean House, near St. Austell, Cornwall, through the kindness of Lt. Col. G. Petherick, and saw a Herring Gull (*Larus argentatus*) sitting on a nest in the fork of a large Scots pine (*Pinus sylvestris*). The tree was about fifteen yards from the coast, and the nest, which so far as could be seen was made of grass, was about thirty feet above the ground. Col. Petherick told me that the birds had been sitting for some weeks, and that a similar nest had been built in 1958. Unfortunately, both attempts proved abortive. This is the first record known to me of this species breeding in a tree, and it is of interest in connection with the record of a Lesser Black-backed Gull (*L. fuscus*) nesting on a thorn bush (*Brit. Birds*, 52: 60).

It may be appropriate to record here that, in addition to the nesting of Herring Gulls in inland china-clay pits in Cornwall (*Brit. Birds*, 41: 277; 43: 94), since when four other clay pits have been colonised, I have records of this species breeding on houses in eleven Cornish towns or villages. These are (listed anti-clockwise round the coast):

Port Isaac (1910)	Mevagissey (1946 onwards)
Porth (near Newquay) (1943)	St. Austell (1958 onwards)
Newquay (1920s onwards)	Polruan (about 1950 and again 1958-59)
St. Ives (1952 onwards)	Polperro (before 1958)
Porthleven (1951 onwards)	Par (1959)
Portloe (1958)	

All of these towns except one are coastal, the exception being St. Austell which lies about three miles inland; there a pair of Herring Gulls has nested on the chimney of the same house for three successive years. In two of the towns the species breeds on houses in considerable numbers, and in one case the roof of a bungalow in course of construction was used. In 1959 a pair nested on the flat wall of a

"tank" at the rear of a china-clay drying factory at Par. In 1958 a pair attempted to do so on the roof of a railway coach at Newquay, and what was presumably the same pair built an unsuccessful nest on a hand-crane at the same place in 1959. On 19th May 1960 I climbed to another nest, probably again of the same pair, on the roof of another railway coach. One egg was subsequently laid, but the coach was moved during shunting operations, whereupon the gulls made a second nest on the railway platform, but this was also disturbed and the one egg laid was taken.

I have two records of breeding in gardens. One pair, in 1955, nested in a flower bed at Polruan, and on 2nd June 1959 a pair was found incubating eggs about seven feet from the windows of a hotel near Mullion (*29th Report Cornwall Bird Watching & Preservation Society, 1959: 32*). Nesting on beaches has been recorded in three localities in Cornwall.

These records seem of interest in connection with similar tendencies on the part of Herring Gulls in other parts of Britain, and also on the Continent, to colonise buildings and other unexpected sites.

C. J. STEVENS

Skylarks and Meadow Pipits eating bread.—At the beginning of 1959 I bought a bungalow on the cliff top overlooking Widemouth Bay, Cornwall. It is 200 feet above the sea in a windswept and treeless area. Acres of cornfields stretch inland from my lawns. From the first I put out bread for the birds on a bird-table, and on the surrounding lawn, not far from my windows. Blackbirds (*Turdus merula*) and Song Thrushes (*T. philomelos*) and also Herring Gulls (*Larus argentatus*) and Rooks (*Corvus frugilegus*) were soon regularly coming to feed. It was in early July 1960 that I was first surprised to notice a single Meadow Pipit (*Anthus pratensis*) eating the brown bread which I was giving the other birds. This it continued to do fairly regularly for two or three weeks and on the morning of 23rd July it brought with it a young bird which it proceeded also to feed on the bread. This was repeated on the next two days, but then it was not until mid-October 1960 that I again saw a Meadow Pipit taking bread. After that, one was rarely far from my garden throughout the winter and fed regularly until early March 1961.

At about the same time as the original Meadow Pipit appeared, in early July 1960, one of a pair of Skylarks (*Alauda arvensis*), which had a nest in the adjoining cornfield, also started to eat bread on the lawn. Subsequently both birds took bread to their four week-old young in the nest and they continued to feed them on it after they had fledged.

I can find no previous record of either Skylarks or Meadow Pipits feeding regularly on bread in this way. FLORENCE E. CARTER

Sand Martin killed by burdock.—On 9th September 1960, at Ecton sewage-farm, Northamptonshire, I found a juvenile Sand Martin (*Riparia riparia*), a day or two dead, firmly trapped by the hooked bracts on a thick bunch of burdock heads (*Arctium*). Its position seemed to suggest that it had perched on the burdock and had then become ensnared by the hooks catching in the feathers of its breast. It had apparently struggled and flapped to escape, with the result that its left wing was also impaled. I picked the burdock concerned, with the bird still on it, and it was later photographed by Mr. F. A. Adams against a stucco wall background. The photograph now reproduced (plate 42a) shows clearly the numerous hooks which were sticking up through the webs of the primaries and secondaries of the left wing.

M. GOODMAN

[A previous note by Miss W. U. Flower (*Brit. Birds*, 51: 276) described how a migrant Goldcrest (*Regulus regulus*) became entangled by a burdock on the Isle of May. In that case it was the bird's soft ventral feathers which were caught, and it was thought that it could not have freed itself without assistance. Another fatal casualty was reported in *The Field* in 1950 (196: 833) by W. V. Crich. This concerned a Ruby-crowned Kinglet (*R. calendula*) in Ontario, Canada, and was illustrated by a photograph. Similarly B. Vida (*Aquila*, 55-58: 295) recorded a Hungarian instance of a Long-tailed Tit (*Aegithalos caudatus*) which died through being caught in thistles. Such accidents are probably not so uncommon, therefore. Perhaps the most spectacular case of birds being caught on plants was described by J. Dorst (*Ibis*, 99: 594-599). He wrote, with regard to the Puya stands of the Peruvian high plateaux, "... we encountered as many as ten corpses spiked on one Puya. There is almost no Puya without mummified bodies of birds that could not escape. The doves are the chief victims. But the number of passerine birds is nearly as high. We discovered corpses belonging to every species that live in the Puyas, except humming-birds ...".—EDS.]

Rooks and Desert Wheatear feeding on sandhoppers.—Several Passerine species have been recorded feeding on sandhoppers (*Talitrus locustra*). These have included Meadow Pipit (*Anthus pratensis*), Swallow (*Hirundo rustica*), Sand Martin (*Riparia riparia*) and Song Thrush (*Turdus philomelos*) (*Brit. Birds*, 45: 76; 49: 502-503; and 53: 224-225). In fact, I think that the habit must be quite widespread among Passerines (and various waders regularly feed on sandhoppers). For example, on 15th June 1950 two of a party of five Rooks (*Corvus frugilegus*) I saw on the shore at Instow, Devon, were feeding on sandhoppers in the tide-wrack. Similarly, on 15th November 1958, at Little Aden, I saw a male Desert Wheatear (*Oenanthe deserti*) and a

Blackstart (*Cercomela melanura*) feeding voraciously on these crustaceans on the shore.

BRYAN L. SAGE

An interesting case of multiple nesting by Great Tits.—The Bird Section of the British Museum (Natural History) recently received from Dr. W. E. China, lately Keeper of Entomology, two photographs of an interesting multiple nest of the Great Tit (*Parus major*), taken in his garden at Westcott, Surrey, in 1934. One of these is reproduced on plate 42b. The birds had completely covered the ground under an inverted flower-pot (which was roughly twelve inches in diameter) with a mass of the usual materials, but, instead of the normal cup at one side, there were three nests, equally spaced round the edge. In addition to the standard drainage hole (through which the birds entered), the flower-pot had three smaller holes symmetrically arranged around its base. Plate 42b shows clearly how the positions of the three nests corresponded with the positions of these smaller holes. It appears that the bird recognised the nest by its position relative to the smaller hole. The nests held five eggs, four eggs and one egg respectively, the total being a normal clutch for this species. All nests were ultimately deserted and no eggs hatched.

Laterally-arranged multiple nests, placed in a series of identical compartments formed by a beam with rafters, a ladder, stacked pipes, or spaces left in a brick wall, have been recorded for a number of species (see especially Hemmingsen 1956); but I have found reference to only one other radially-arranged example, which was also in Surrey. This was a nest of the Blue Tit (*P. caeruleus*) under an inverted earthenware bowl which appears from photographs to have been about a foot or fifteen inches in diameter (Reynolds 1944). The birds entered through a drainage hole in the base, and five complete and two partial nest cups were arranged in a circle occupying most of the area under the bowl. There were two eggs in one nest and one in each of three others. It is not possible to tell from the published photograph whether additional drainage holes were present in the base of the bowl.

C. J. O. HARRISON

[It would appear that, after entering the central hole, the birds were disoriented by the symmetrical pattern of light entering through the three exactly similar smaller holes. In sunny conditions the shafts of light would vary according to the time of day and this may possibly have added to the birds' confusion.—EDS.]

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Lesser Whitethroat feeding on suet.—On several occasions on 13th and 14th August 1960 I watched a Lesser Whitethroat (*Sylvia curruca*) feeding on a block of suet fixed under the flat top of a bird table, on the open lawn in my garden at Lightwater, Surrey. It went to the suet so confidently that it seemed likely that this was not the first occasion it had done so. Each time it perched on top of the suet and pecked vigorously until displaced by Great Spotted Woodpeckers (*Dendrocopos major*) or tits. This bird must have been a passage migrant, since the species is not a summer resident in the vicinity.

R. W. HAYMAN

Blackbird population imitating human whistle.—My parents have lived in our present house at Colchester, Essex, since 1913. I can remember back to about 1924, and during all this time my mother has been in the habit of using, fairly often, a particular four-note whistle as a means of calling other members of the family, various pets and the chickens. During the summer of 1949 I was home only occasionally at week-ends, but I noticed that a Blackbird (*Turdus merula*) was imitating this whistle perfectly and had incorporated it into its song. Its favourite song post was in a plum tree about ten yards from the pantry window, out of which my mother often used to make this whistle. She also had to pass close by this tree every time she went down the garden, so the bird had plenty of opportunity to hear the sound. In every succeeding year up to and including 1961, a total of thirteen seasons, one or several Blackbirds over a radius of about a quarter of a mile have used the same distinctive phrase in their songs. As not all of them sing it as often as others, it is very difficult to be sure of the exact number, but I get the impression that it has never been used by less than two individuals, or by more than five or six.

Sometimes the whistle is uttered singly, but more often it is tacked on to one of the bird's own song phrases. Sometimes it is repeated twice, and occasionally one or other of the Blackbirds has made a simple variation by repeating the last two notes. I can never remember, however, hearing one prefacing any of its own song phrases with the whistle. It is always the other way about. I also once heard it given in a sub-song at a roost in February. One year in June a Blackbird sang almost continually in a very small area for two or three days (I thought at the time that it might have lost its mate or been driven from its original territory) and during this period I never heard it sing anything else but this one whistle—so much so that I began to wish heartily that it had never learnt it.

I find that a Blackbird which is already able to imitate the whistle can often be induced to perform if I whistle first. Within a minute or so it will always answer back. It has been suggested that the birds

have thus been taught afresh each year, but I do not think this can be so, having had experience of the immense amount of repetition which is needed to teach even such a gifted mimic as an African Grey Parrot (*Psittacus erithacus*) to imitate something to order. I think that several Blackbirds learnt from the original mimic, and that by whistling to them I only "jog their memories". It seems interesting that this song phrase should have persisted so long, and I wonder whether bird song may not sometimes evolve by such means.

Our cat has heard this whistle from Blackbirds all his ten years of life, and our dog for twelve out of his fourteen years, but although it is a most excellent and true imitation, both in pitch and tempo, I have never seen either of them taken in by it.

R. V. A. MARSHALL

Rock Pipit using its feet to disturb prey in sand.—On 19th March 1961, at the mouth of the Nevern estuary near Newport, Pembrokeshire, I saw a Rock Pipit (*Anthus spinoletta*) fly from some dunes to the shore and forage on the sand, which was damp from seepage. It walked with short steps and frequently stood moving its feet with a shuffling motion; it also scraped both feet flat on the ground without raising them. Once it pivoted from side to side, turning on its feet. These actions seemed to be effective in revealing prey since it often pecked at the ground, not at its feet but a little way ahead. I could find nothing to suggest what the prey might be, but it is unlikely to have been marine worms as the bird was foraging very near to the edge of the dunes. The foot movements evidently caused small invertebrates to move and show themselves, and were not directly instrumental in uncovering them. I eventually lost sight of the bird and about ten minutes later it was perched on a jetsam branch, whence it flew back to the dunes.

T. A. W. DAVIS

Lesser Grey Shrike impaling prey on thorns.—In the last paragraph of his recent article on the Lesser Grey Shrike (*Lanius minor*) (*Brit. Birds*, 53: 397-402), I. J. Ferguson-Lees says that this species "does not appear to indulge in the shrike habit of impaling prey in 'larders' ". When he wrote this he was unaware of the following incident.

In June 1960, on the Black Sea coast of Bulgaria between Balçik and Varna, I was watching a Lesser Grey Shrike collecting food for its nestlings. It dropped down from a wire, seized an object from the ground in its bill, and then flew with it to some brushwood near-by. Watching from cover through binoculars, at a range of about 30 yards, I saw the shrike impale the object on a pear thorn and fly away. On investigation this proved to be a Mole Cricket (*Gryllotalpa*), which was still alive although impaled through the upper abdomen. On other

spikes were some dried insect remains which I could not identify, and these could also have been placed there by this bird. The nest was about 60 yards away.

J. STAFFORD

Myrtle Warbler in Devon.—An immature Myrtle Warbler (*Dendroica coronata*) was identified on Lundy, Devon, on 5th November 1960 and it remained on the island until the 14th. It was first seen at 11.0 a.m. on the 5th in Millcombe gardens. Attention was attracted to it by its bright yellow rump, which was visible in flight. Excellent views were then obtained, at distances down to four yards, as the bird fed on the ground and from an ivy-covered wall where it caught flies in a very flycatcher-like manner. It was slightly smaller than a Blackcap (*Sylvia atricapilla*) near-by, but its general shape was more that of a flycatcher than a warbler. Its bill was black and flycatcher-like. Its head appeared at first to be uniform brown with a slightly paler and more greyish superciliary and a pale ring around the dark eye, but closer observation from above revealed a slight yellow patch on the crown. The mantle and back were greyish brown, streaked with darker brown, especially on the "shoulders". The rump was brilliant lemon yellow and this contrasted sharply with the tail, which was black except for white patches towards the ends of the outer feathers (these last showed only in flight). Later, the upper tail-coverts were seen to be striped black and grey. The wings were almost black, with two whitish bars across each, except that pale edges to the primaries gave them a slightly streaked appearance when closed. Chin and throat were whitish, and the breast a light greyish-buff with dark streaking on the sides and a slight yellow patch in each "armpit" (more prominent on one side than the other). The flanks were pale greyish-buff with dark streaks. Legs and feet were black.

Frequent attempts were made to catch the bird in mist-nets, but it was not until 11.30 a.m. on the 8th that it was eventually trapped and ringed. During the intervening period it had frequently been heard to utter a loud *chick*, both in flight and while feeding. The following detailed description was taken of the bird in the hand:

Upper-parts. Forehead grey-brown with dark brown central streaks to feathers; central crown bright lemon yellow, obscured by large brown fringes and tips; nape brown, some feathers with black shaft streaks. Superciliary slight and pale whitish-buff; orbital ring with white areas at top and bottom; lores black with buff-brown tips; ear-coverts pale brown. Mantle brown, upper feathers fringed grey, all with dark centres; back black with wide brownish-grey fringes; rump bright lemon yellow; upper tail-coverts black with broad pale grey fringes. *Tail* mainly black-brown; outer feathers with slight white fringes on outside edges, others with grey fringes on outer webs; central pair also fringed white on inner webs; outer two on each side with a white patch on the distal part of the inner web, these patches being largest on the outermost.

Wings: primaries and secondaries dark brown with pale greyish fringes on outer webs and white fringes on inner webs; primary coverts dark brown with slightly paler fringes; greater coverts black-brown with pale brownish-white fringes on outer webs, and buffish-white tips forming a white wing-bar; medium coverts black with broad white tips forming a second wing-bar and outer webs slightly fringed whitish; lesser coverts black-brown with broad grey fringes on both webs, washed brownish towards the tips. *Under-parts.* Chin white, washed buffish-brown; throat pale whitish-buff, fringes washed brownish. Breast feathers dark brown, broadly fringed whitish-buff; those on sides of breast with more pronounced black centres; feathers immediately under the wings fringed bright yellow, forming a distinct yellow patch on each side; flank feathers black-brown with broad buffish-white fringes, giving a streaked appearance. Belly white, washed pale yellowish-buff; under tail-coverts white, proximal ones with a slight buffish wash. Under wing-coverts brownish-grey with greyish-white fringes, those under the bastard wing being black-brown with slight pale greyish-white fringes. *Soft parts:* bill black; legs and feet black, soles blackish-brown; iris very dark brown. *Measurements:* wing 72.5 mm. (73.5 mm. straightened), tarsus 21 mm., weight at capture 11.9 gm. *Wing formula:* 4th primary longest, 2nd 2.5 mm. shorter, 3rd 1.0 mm. shorter, 5th 2.0 mm. shorter, 6th 6.0 mm. shorter, 7th 9.0 mm. shorter, 1st minute and hidden (6 mm. shorter than coverts); 3rd, 4th and 5th emarginated on outer webs. Feathers of wings and tail abraded at tips.

The bird was photographed in colour, ringed (87300) and released at 2.0 p.m. As already stated, it remained on the island for a further six days. Apart from the writer, a number of other observers watched it. Those who saw it in the hand included F. W. Gade, F. G. Lyall, J. Ogilvie, M. and V. Squire, and A. W. Strick.

This is only the second record of this American species in Britain and Europe, the first also having been in Devon, at Newton St. Cyres, near Exeter, in January and February 1955 (*Brit. Birds*, 48: 204-207 and plates 25-28). However, it should be remembered that there are at least two records of Myrtle Warblers crossing the Atlantic on board ship to within sight of the coast of Ireland or Britain (*Brit. Birds*, 52: 237-238).

W. B. WORKMAN

Greenland-type Redpolls nesting in Inverness-shire.—While photographing in the Spey Valley, Inverness-shire, in 1959, we were shown the nest of a Redpoll (*Carduelis flammea*) by a local gamekeeper. The keeper, a very experienced nest finder and well acquainted with all the local birds, stated that the adults were "not ordinary Redpolls" (which he knows very well). He claimed that they were larger and had a very pronounced double white wing-bar which even in flight distinguished them from the usual ones breeding there.

This pair had already been shown to Mr. and Mrs. W. Cairns who were also photographing in the area and they had made a colour film at the nest. As the birds were therefore used to a hide, we erected a small pylon on the evening of 23rd May. The nest, which contained

five large young nearly ready to fly, was itself not typical of that of a Lesser Redpoll (*C. f. disruptis* and *cabaret*), with which we are both familiar. The nest of the British race, *disruptis*, is often characterised by a flat platform of sticks supporting a shallow cup-shaped structure. The whole is thus rather flat in appearance, and roughly and untidily built of relatively coarse twigs. This nest was larger and deeper than is usual for *disruptis*, and it tapered to a rough point where it fitted into the crutch of a juniper bush, five feet from the ground. It was built of juniper twigs, heather bents and grass stems and lined in typical Redpoll manner with hair and feathers. The locality was a small oasis of about two acres of juniper scrub at a point where the grazing meadows of a farm gave way to the rough pasture of higher moorland, and several pairs of Lesser Redpolls were also breeding.

Our hide was occupied on 24th May from around mid-day until 2015 hours. Good views were obtained of both adults from a distance of four feet as they fed their young. They were similar, except that the male was brighter. Their general appearance was that of large and coarse Lesser Redpolls. Particularly noticeable was the heaviness of the bill, which appeared both broader and deeper than in a typical Lesser Redpoll. The under-parts were greyish-white, with few markings except on the flanks which were boldly patterned with heavy streaks. These were much more noticeable than the streaks on the flanks of *disruptis* and the difference might be compared with the difference between the breast spots of Song and Mistle Thrushes (*Turdus philomelos* and *viscivorus*). The crimson on the forehead seemed paler than in *disruptis* and there was no pink on the breast. The upper-parts had the usual grey-brown, streaked appearance of a Lesser Redpoll and did not appear any darker, but the greyish white wing-bars seemed more prominent. Some check as to size was obtained in the following way. The birds were photographed from a known distance, with the aid of high speed flash and a lens of eight-inch focal length. The size of image produced by a lens is a function of the distance of the object, its size and the focal length of the lens. It was possible to set up the camera again with an eight-inch lens and to determine what length an object had to be to produce a similar-sized image to the one already obtained. A further check was made from the photographs, using such known measurements as the diameter of the nest and the distances between certain branches as a means of estimating the size of the bird. Allowing for the fact that absolute side views were not obtained, this was nearly six inches. Thus in size, as well as in appearance, these birds seemed to agree well with the Greenland race (*C. f. rostrata*), though it must be borne in mind that a minority of Iceland Redpolls (*C. f. islandicus*) are hardly separable from this form. Confirmation was later obtained by an examination of skins of the various races of

Carduelis flammea at the British Museum (Natural History). The fact that the two birds of the pair were very nearly alike seems to militate against any suggestion of their being aberrant Lesser Redpolls.

The only note heard was a *chup-chup* call. Feeding visits were made at roughly half-hour intervals. The birds stayed at the nest for only about a minute on every occasion and were not to be seen in the area between visits. Photography was handicapped by the large size of the young which meant that approach near to the nest had to be restricted for fear of their "exploding". They had fledged successfully by the evening of 26th May. The empty nest was then collected and kept.

On 27th May another Redpoll nest was found and a hide was erected again at four feet. These birds were typical Lesser Redpolls, however, and we were impressed by the difference between them and those we had watched earlier. Their nest was also in a juniper bush, but was typical of that of *disruptis*.

The Handbook states that, generally speaking, field identification of *rostrata* cannot be relied on, especially as problematical intermediates occur. Our conditions of observation were, however, more comparable with watching captive birds, and the difference between the Greenland-type Redpolls and the typical Lesser Redpolls examined under the same conditions only a very short time afterwards cannot be over-emphasised. Photographs of one of the birds at each nest are reproduced on plates 40 and 41.

R. K. MURTON and S. C. PORTER

[The Redpolls are a complicated group and, in connection with this interesting note, we asked Kenneth Williamson to prepare the review of their taxonomy which appears on pages 238-241.—Eds.]

White-crowned Sparrow crossing Atlantic on board ship.—On 30th May 1948, when we were a day out from Newfoundland on board the S.S. *Nova Scotia* bound for Liverpool, a White-crowned Sparrow (*Zonotrichia leucophrys*) attached itself to the ship. It remained with us for several days, until the morning Ireland appeared on the horizon. We then saw it no more, and it is a safe conclusion that, seeing land, or sensing the proximity of land, the sparrow went off to fend for itself. It might have reached anywhere in Ireland, Scotland or England. During its time on board, it would often disappear for long periods, either riding on some other part of the ship or flying at large over the water, but always returning to the vessel sooner or later, until the last morning. Other passengers supplied it with vast amounts of food and water, enough to satisfy a pelican! There was no difficulty about the identification, for its clearly striped black and white crown

and the absence of the snowy white throat patch found in the White-throated Sparrow (*Z. albicollis*) established this beyond doubt.

I am very familiar with the more common White-throated Sparrow and I have a pencilled note to the effect that one came aboard the M.V. *Erria* when I was crossing the Atlantic in a westerly direction in October 1943. Unfortunately, however, I have no further details of this and only just remember the occurrence. At that date we were expecting a different sort of visitation! Nevertheless, this record also supports the contention that many more birds than is generally realised make use of ships crossing the Atlantic. My own opinion is that, in almost every case, the small American Passerines found in Britain and Ireland have had an assisted passage. A. L. PARISH

[We are always glad to receive records of American birds crossing the Atlantic in this way. Two White-throated Sparrows made the crossing on board ship in October 1957 (*Brit. Birds*, 51: 358) and there have been several similar records of Myrtle Warblers (*Dendroica coronata*) and other species (e.g. *Brit. Birds*, 52: 237-238).—EDS.]

Review

Instructions to Young Ornithologists. II. Bird Behaviour. By Derek Goodwin. Museum Press, London, 1961. 123 pages; 11 line drawings and 17 half-tone illustrations. 12s. 6d.

The rather dry title and conventional jacket of this unassuming work conceal an eminently readable and highly competent introduction to bird behaviour—the first (and, we hope, not the last) book by a man who more than anybody else has a claim to the title of the “British Heinroth”. Like his great predecessor, Derek Goodwin has a wide and accurate first-hand knowledge of the behaviour of birds, and of other aspects of their everyday life. He, too, has acquired this knowledge by raising and keeping many species, and by intently watching them in zoos and in the wild. He has the same extraordinary gift of observation, and of engraving details in his memory. He has the same ability to say biologically significant things in simple, yet perfectly clear language. A visit by Derek Goodwin is like an ornithological Christmas dinner—the food is tempting and super-abundant, but one needs time and energy afterwards to digest the almost overwhelming mass of solid stuff.

Goodwin also shares with Heinroth a certain dislike of theorising; and his interest in analysis has its limitations. Consequently, his book does not penetrate deeply into any problem. But its strength lies in the wealth of data concerning two “first steps” of analysis: it stresses

the biological adaptations of many behaviour patterns; and it demonstrates time and again that much behaviour does not show insight and is very often not even learnt, but "instinctive". And these things are shown extremely well. Throughout the book one senses Goodwin's delight in rediscovering these basic truths again and again in the wide variety of behaviour patterns he has himself studied.

One might ask whether, in restricting himself to these relatively simple levels of inquiry, Goodwin has not underrated the intellectual abilities of "young ornithologists" (whose age is not mentioned, I suppose because there can be no limit!). His justification is, I believe, that by performing his restricted task with such accomplishment he puts across one fundamental message that is as important now as in Heinroth's time: that to study behaviour patterns as parts of adapted systems in a great variety of animal types is to enter a biological wonderland of great beauty. By thus arousing interest (almost by hidden persuasion) rather than, as the publishers required, by "instructing", Goodwin may well influence young biologists to a greater extent than more professional or more technical writers could do.

N. TINBERGEN

Letters

The need for distinctive bird-names

Sirs,—Two centuries ago the shores of Britain formed a horizon that was more than ample for a parochial bird-watcher like Gilbert White. The birds found within that horizon in his day were naturally considered "British" birds—as distinct from those exotic birds of which an occasional specimen might turn up, like a shipwrecked mariner, on British shores.

I suggest that this has now changed, that the horizon of most British bird-watchers has been expanded to include a large part, at least, of Continental Europe. A relic of the past persists, however, in some of the common English names of the birds that must now be regarded as cosmopolitan. When the bird-watcher's vision did not ordinarily extend beyond Britain, it was quite all right to call *Ardea cinerea* simply "the Heron", as if there were no other species of *Ardea* from which it had to be distinguished; it was all right to call the Bittern "the Bittern", the Buzzard "the Buzzard", the Swift "the Swift", the Treecreeper "the Treecreeper", the Wheatear "the Wheatear", and so on. Since each was the only one of its kind within the established horizon, there was no need for distinguishing adjectives. Within today's new horizon, however, there is such a need. It is excessively

awkward, for example, for the English-speaking bird-watcher in the Alps, where Alpine Choughs are common, to refer to the other Chough simply as "*the* Chough" (bearing down hard on the article) or as "the common Chough", particularly as it is so uncommon there. It is also excessively awkward on the Swiss lakes, where Black Kites are common in summer, to refer to the other Kite as "*the* Kite" or "the common Kite", when it appears there only as a rare migrant.

It would not be hard to correct this situation. The competent authorities could assign a qualifying adjective to every species that now lacks one, where there is a possibility of confusion with other members of the family. (This might be welcome even to the stay-at-home Briton in the cases of the Redstart and the Whitethroat.) Thus what is now "the Kite" might become "the Red Kite" and "the Heron" might become "the Grey Heron" (or "the Great Grey Heron", to hold its own with the American "Great Blue Heron"). This would impose no burden on the tongues of bird-watchers in Britain, because in the normal course of events they would presumably continue to refer to, for example, "the Heron"—in the same way as the Eastern Meadowlark is called simply "the Meadowlark" in eastern North America, where there is no other Meadowlark. We English-speaking bird-watchers outside Britain, however, would be relieved of an annoying nomenclatural awkwardness.

LOUIS J. HALLE

The "Lesser Scaup" affair

Sirs,—In a previous protest (*Brit. Birds*, 54: 167-168) at the shooting of the Sutton Courtenay duck which was at first thought to be a Lesser Scaup (*Aythya affinis*) and which is now regarded as a hybrid Tufted Duck \times Pochard (*A. fuligula* \times *A. ferina*) (*Brit. Birds*, 54: 49-54), I pointed out that those concerned had overlooked opportunities for further examination that the taking of the bird provided. I suggested that a study of the haemoglobin and serum components, and also of the chromosomes, might well have afforded a means of testing the hybridity hypothesis and perhaps of identifying the parental species.

It has since been put to me that further shooting would have been required to provide comparative material. This is not necessarily so. The chromosomes in testicular preparations from the original bird might have provided definitive evidence of F_1 hybridity and it is possible that sufficient additional serological information for a useful comparison could have been obtained from a single live bird of each of the parental species.

C. E. FORD

- 8 JUN 1961

PURCHASED



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British Birds

Vol. 54 No. 7

JULY 1961



The display of the Capercaillie

By Harry G. Lumsden

Ontario Department of Lands and Forests

BETWEEN 10th and 25th April 1960 I watched the behaviour of a number of Capercaillies (*Tetrao urogallus*) at a display ground in Aberdeenshire. The area in which these observations were made lay on the hill of Sluie on the north bank of the river Dee about two miles south-east of Kincardine O'Neil.

On 10th and 11th April I searched the area for Capercaillies, starting before the first light of dawn. The places where each bird was seen or flushed were carefully noted. This type of search was repeated on the 16th to make sure that no display grounds had been missed. On 12th, 15th and 17th April various hide positions were tested and preliminary observations were made of the behaviour of the birds. Between the 18th and 25th observations were made each morning on one of the display grounds. On the 13th a gale with rain squalls prevented early morning observations, but on this and many other days I was present on the hill during the day adjusting hides and searching for birds. No attempt was made to study the behaviour in the evening.

It is a pleasure for me to acknowledge here the great kindness of Brigadier and Mrs. B. C. Bradford of Kincardine, who gave me permission to watch the birds on their estate and who helped me make observations on the morning of 23rd April. I was also helped on several days by Mr. A. Duguid, and by Mr. C. Burges-Lumsden on the 22nd. I am most grateful to Mrs. E. G. Jermolajev who translated Russian papers for me and to my wife, Karin, who translated German and Swedish texts.

TIME AND PLACE OF CAPERCAILLIE DISPLAY

On the hill of Sluie display was well under way on 10th April and I do not know when the birds first started to visit the display grounds.

According to Fuschlberger (1956), Capercaillie cocks in Germany begin to display in March, or even exceptionally in late February, on their winter home range. Later on they move to the communal grounds where a number of cocks may hold territories and where most display takes place. Hainard and Meylan (1935) believed that display started much later in the high Jura, perhaps even as late as April. Kirikov (1947), writing of the Capercaillies inhabiting the pine-birch-larch forest of the Bashkir Nature Reserve, heard the first songs at display grounds on the last few days of March or the first in April. In the exceptionally warm spring of 1942 he heard two cocks singing on 20th February. He found that the migratory Capercaillies of the broad-leaved forest-steppe zone displayed on their arrival at their breeding grounds in the southern Urals about 16th to 19th April.

According to Fuschlberger, the spring display period in Germany may continue well into June and ends with the onset of the moult. He writes that the autumn period of display may begin as early as August, but does not become regular until September and October.

Kirikov draws a distinction between summer and autumn display. Between 1939 and 1945, in the Bashkir Nature Reserve, he found that the commencement of summer display, which took place on the display grounds, varied between 28th July and 17th August. This display period, which coincided with the moult from summer to winter plumage, ended between 22nd and 30th August. All the thirteen displaying birds he collected at this time proved to be fourteen to fifteen months old. He points out that autumn display did not take place on the display grounds and gives a number of dates in October when he heard birds singing. Capercaillie apparently continue to display irregularly throughout the winter in the Bashkir Nature Reserve and he mentions dates in November, January and February when cocks were heard performing.

In common with the "lek" species of grouse the same places may be used as display grounds year after year. Fuschlberger mentions one place where seven displaying cocks were shot out of the same tree over a period of ten years. Kirikov found the same places used year after year by the migratory population of Capercaillies that he studied.

I have no information on the continuity of use over the years of places chosen as display grounds on the hill of Sluie. I found two display grounds which were used each morning during the period of my observations. Both were found on 10th April on my first search of the hill. On that day the "east" display ground held eight birds of which at least three were cocks and two were hens. I was unable to determine the sex of the other three. On the "west" display ground there were four cocks and one hen. I heard three other cocks singing at other places on the hill.

TERRITORIAL BEHAVIOUR

On the "west" display ground, where I made most of my observations, it was possible to distinguish individually two of the three territorial males. One, which will be called the "south" cock, in whose territory I placed my hide, was a large and extremely black bird with very few white marks on his tail. The second, which will be called the "hill" cock, had lost a patch of feathers from the side of his head. A third, and I assume that the same bird occupied this area daily, had no special distinguishing features, and will be called the "east" cock. All three birds remained within well-defined areas, the boundaries of which did not touch those of their neighbours.

The three photographs on plate 50 were taken from the same position east of the display ground. On them I have marked in white the approximate boundaries of the cocks' territories. The "south" cock normally defended and displayed on a small knoll in an area about 10 yards wide and 30 yards long (plate 50a). The "hill" cock remained within an area 25 yards by 40 yards, the edge of which was about 25 yards from the edge of the "south" cock's territory (plate 50b). The "east" cock displayed in an area about the same size as that of the "hill" cock. Part of his territory, however, lay out of sight of my hide behind a fallen tree (plate 50c). The edges of his territory lay some 20 yards from the boundary of that of the "hill" cock and 40 yards from the easternmost boundary of the "south" cock's territory.

The species composition of the forest at this display ground was about 50% birch (*Betula alba*), 30% larch (*Larix decidua*), and 20% Scots pine (*Pinus sylvestris*). There were some thickets of young birch in the area. (Both the display grounds were situated close to the edge of the wood where there were clumps of larches; as these came into leaf the young shoots were heavily used as food.)

Between their territories there was a substantial strip of ground undefended by these birds. Here they ignored the non-territorial males which visited the display ground on most mornings. If this situation is typical of Capercaillie display grounds, the behaviour of this species contrasts with that of the Black Grouse (*Lyrurus tetrix*), and of the Greater Prairie Chicken (*Tympanuchus cupido*) and Sharp-tailed Grouse (*Pedioecetes phasianellus*) of North America. "The territories of cocks of these "lek" species abut on one another and they spend much time in ritual and actual fighting as well as displaying at one another along their boundaries. Because of this important difference I do not believe that the term "lek" is appropriate when discussing a Capercaillie display ground.

These three Capercaillie cocks on the "west" display ground were

occasionally seen to leave their territories during the display period in the morning. The following instances were recorded.

On 22nd April a hen flew down out of a tree and settled on the ground about thirty yards west of the edge of the "south" cock's territory. When he followed her, she moved still further to the west and they both disappeared from view behind a dense thicket of young birches. They were joined by two more hens, by the "hill" cock, and by two non-territorial cocks. I was unable to see most of the subsequent activity, but I could hear repeated songs and occasionally the sound of beating wings.

On 20th April two hens flew down and landed in the unclaimed area between the territories of the "hill" and "south" cocks. Immediately both males, with breast feathers erected in threat display, hurried towards them. They stopped at the bottom of a shallow depression, some five yards apart, and performed several displays* at each other. Breaking off this activity, they approached each other with tails partly closed and held at an angle of about 70° . When their lowered heads were about a foot apart they stopped for a few seconds and pecked at each other. The blows, which did not seem to connect, appeared to be aimed at the other's beak. Suddenly the "hill" cock retreated two or three steps and carried out a sequence of movements which will be described later and which I have called the bowing display and have tentatively interpreted as a "high intensity threat display". They resumed the performance of displays for about half a minute, until the "south" cock turned to round up the hens and drive them into his territory.

On 22nd April a similar sequence of events took place. On this occasion the "south" cock reached the single hen first and placed himself between her and the "hill" cock. While the "south" cock was driving her into his territory, the "hill" cock ran down to interfere. He then performed three "high intensity threat displays" in rapid succession. Simultaneously with his last one, the "south" cock also executed this display. Each cock resumed the song display posture and, after completing several songs, returned to his territory.

I saw no real fights on the hill of Sluie in 1960, perhaps because the period of territory establishment was over when I started my observations. I have mentioned that the "hill" cock could be recognized by a patch of feathers missing from the side of his head. These may have been lost during a fight. Fuschlberger describes savage fighting between cocks at the time when they were establishing territories. Kirikov also reports bitter fighting and mentions one cock which even attacked the dead body of its adversary after it had been shot.

*See discussion under SONG DISPLAY.

Hainard and Meylan saw no real fighting in spite of many hours of observation. They described how four cocks and two hens displayed on 29th April: "The cocks passed and repassed untiringly one before the other, without paying the least attention to one another. During one and a half hours that morning that our observations lasted there was no combat, not even the least hostile gesture. There was no copulation. Later, about mid-May, at the time of copulation the display enters a second phase, that of the defence of territory" (my translation). Even during the territorial phase of the breeding cycle they saw no fights and believed that if they occurred they were far from being the rule.

BEHAVIOUR OF NON-TERRITORIAL COCKS

The "west" display ground was visited nearly every morning by varying numbers of cocks which defended no territories during the period of my observations. Most of those that I was able to examine at sufficiently close range appeared to be yearlings. They were usually appreciably smaller than the territorial cocks and their beaks were dusky instead of conspicuous ivory-green in colour. Their tails were shorter and the rectrices narrower. Chiefly, however, they differed in behaviour. They arrived on the display ground usually well after the territorial cocks had begun to display. When they had roosted in the trees near the display ground, they were later to descend. They stood still or circled the display ground and sometimes behaved aggressively towards one another. Even in the presence of females they did not perform the full song display, although they sometimes erected their tails and uttered a few clicks. On a few occasions they did not react in any way to the presence of hens.

Fuschlberger points out that yearling males usually perform the song display imperfectly at the beginning of the mating season and then display properly towards the end. Kirikov also comments on the incomplete songs of yearling males and presents data which suggest that these young birds start to visit the display grounds later in the spring than the older cocks. Nevertheless, he believes that yearlings of the South Ural population were sexually mature and points out that the average testes weight of yearlings collected in the spring fell above the minimal weight of the testes from birds two and three years old. He also quotes S. A. Khvatov (1861), who reported captive yearlings which bred.

The territorial cocks ignored these "yearlings" when they wandered into the unclaimed areas between their territories, and the "south" cock even tolerated one in his territory for about ten minutes one morning before he drove him away. This particular yearling stood quietly with neck extended forward, head and bill pointed slightly

BRITISH BIRDS

TABLE 1—NUMBERS OF CAPERCAILLIES (*Tetrao urogallus*) VISITING THE "WEST" DISPLAY GROUND, ABERDEENSHIRE, APRIL 1960

	Territorial cocks	Non-territorial cocks	Hens
12th April	1	0	2
18th April	3	3	4
19th April	3	3	9
20th April	3	1	6
21st April	3	4	9
22nd April	3	3	4
23rd April	3	4	6
24th April	3	0	1
25th April	3	1	1

upward, beard not erected, and tail closed and lowered. Had he adopted an aggressive posture, it is likely that he would have been attacked immediately.

On two mornings a cock which may not have been a yearling appeared at the east end of the display ground. He did not perform song displays and did not defend a territory, although on one occasion he directed a bowing display at a yearling cock. Later the same morning he performed this display three times, but I was not able to see the object of his attention.

Table 1 gives the number of territorial and non-territorial cocks and the number of hens which visited the "west" display ground on the nine mornings for which I have complete observations.

BEHAVIOUR OF HENS

Capercaillie hens did not normally roost in the trees on the "west" display ground, but a single one certainly did so once and the same thing possibly happened on two other occasions. They usually spent the night elsewhere and flew into the trees at the display ground in the morning an average of 15 minutes after the first song was uttered by a cock. The times of arrival of the first hen are presented in Table 2.

On no occasion did incoming hens land directly on the ground; instead they usually settled high up in larches. Before 19th April no hens were seen to descend to the ground at all, although they sometimes worked their way to the lowest branches of the trees. Table 2 also shows the times when the first hen was seen to descend to the ground on each morning from the 19th to the 25th.

MORNING ACTIVITY AT THE "WEST" DISPLAY GROUND

Capercaillie are by no means the first birds astir in the morning. Among diurnal species I always heard Robins (*Erithacus rubecula*),

DISPLAY OF CAPERCAILLIE

TABLE 2—TIMING OF MORNING ACTIVITIES OF CAPERCAILLIES (*Tetrao urogallus*) AND OTHER BIRDS AT THE "WEST" DISPLAY GROUND, ABERDEENSHIRE, APRIL 1960
All times are GMT

	18th	19th	20th	21st	22nd	23rd	24th	25th
Time of sunrise	4.54	4.52	4.49	4.47	4.44	4.42	4.39	4.37
Weather conditions	o/10	light over-cast	5/10	o/10	3/10	7/10	light over-cast	heavy over-cast
First song of Robin (<i>Erithacus rubecula</i>)	3.44	3.55	3.44	3.36	3.33	3.29	3.39	3.49
First call of Red Grouse (<i>Lagopus scoticus</i>)	3.43	3.47	—	3.26	3.36	3.05	3.36	—
First song of Song Thrush (<i>T. philomelos</i>)	3.49	4.02	—	—	3.40	3.36	—	3.55
First call of Capercaillie ♂	4.12	4.07	3.59	3.53	3.44	3.49	3.56	4.12
Arrival of first Capercaillie ♀	4.33	4.16	4.19	3.57	4.16	3.54	4.14	4.25
First ♀ to descend to ground	—	4.50	5.11	4.20	4.20	4.10	—	6.05
Number of copulations seen	0	0	1	4	1	7	0	0
Species of copulations	—	—	5.21	4.26 to 4.47	4.25 to 6.20	5.20 to 6.20	—	—

Song Thrushes (*Turdus philomelos*), Blackbirds (*T. merula*), Carrion Crows (*Corvus corone*), Wood Pigeons (*Columba palumbus*) and Pheasants (*Phasianus colchicus*) before the Capercaillie cocks started to call. On an average Robins started to sing 65 minutes, Song Thrushes 59 minutes and Capercaillies 46 minutes before sunrise between 18th and 25th April. On overcast mornings all species began later. Table 2 summarises the times when various species started to sing.

Between 6.00 and 6.30 a.m. GMT, about the time when the sun had mounted above the hills and the display ground was bathed in direct sunlight, the hens and non-territorial cocks usually left. Sometimes the hens took off directly from the ground, but more often they flew into the trees before leaving. With their departure the intensity of display rapidly declined. The territorial cocks usually remained until I frightened them on leaving my hide. On some mornings, however, one or more wandered away on foot shortly after the hens departed.

Fuschlberger mentions that cocks often return great distances to their home ranges after the display period in the morning is over. I saw some evidence of this movement on the hill of Sluie. On 15th April, at about 6.30 a.m., three large cocks came into the wood from the south-west, flying together; they were travelling very high, had crossed the Dee valley and were coming from the direction of Craigmore, a distance of at least 1½ miles. On 16th April, at about 6.20 a.m., a single cock came to the hill of Sluie from the east; this bird also was flying very high and had probably come about three-quarters of a mile from the Craighash wood. On 22nd April, at 6.05 a.m., a small cock flew out of a pine plantation half a mile east of the hill of

Sluie and headed for its north face. On 24th April, at 6.57 a.m., a large cock came over the hill of Sluie from the north, flying very high; he planed down, swung to the west and disappeared round the end of the wood, a distance of at least two miles. I saw no Capercaillies flying such distances at other times of the day.

SONG DISPLAY

The displays of Capercaillies have frequently been described in the Continental literature, but there seem to be few good accounts in English. Witherby *et al.* (1941) quoted only Millais (1909) and Lloyd (1867), and depended chiefly on French and German authors for their descriptions. While concealed in a hide on the "west" display ground I was able to watch their displays very closely, occasionally at a range of one or two yards.

In common with that of other species of grouse, the sequence of movements and song which has been described as the courtship display has two functions. On a display ground it is used as an intimidating display when directed at other cocks, and when performed round a female on the ground it seems to have an erotic function. There may be subtle differences in the performance in different contexts, but I was unable to detect any.

There is great variation in the intensity with which this display is delivered. During rain showers, or late in the morning, cocks may only perform the first part of it and may not erect and spread the tail normally. On the other hand, it is delivered with great vehemence when two cocks are trying to intimidate one another or when one is displaying before a hen. Without the stimulus derived from the presence of hens, there may be lengthy periods between performances of the display, but when hens are present song displays are delivered continually.

In the song display the cock's tail was spread through an arc of about 180° and erected at an angle close to the vertical. The wings were slightly lowered and the carpal joints were held close to the body but outside the flank feathers which cover them at rest. In high intensity display the tips of the primaries were lowered so that they often scraped against obstacles on the ground or were brushed by the bird's toes as he walked. When chasing a hen, a cock might even hold his wings well out from his body. The white shoulder patches were exposed. The neck was extended and held almost vertical while the bill was pointed upwards. The long feathers beneath the bill were erected and stood out like a beard. With legs slightly bent, the bird moved about or stood still while performing the song. This began with a series of double clicking noises, which may be rendered as *ki-kop*, the two parts of which were normally uttered about half a second apart at

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FIG. 1. Posture adopted by the male Capercaillie (*Tetrao urogallus*) during song display. The tail is spread almost vertically, while the wings are drooped and the white shoulder patches exposed. The neck is extended and the bill pointed upwards, with the long feathers of the chin and throat standing out like a beard, as the bird utters its curious song (pages 264-266)

first. The bill was opened on the first click and closed on the second. At the same time the oesophagal area was sucked in as if the bird suffered from hiccoughs. The nictitating membrane sometimes flicked over the eye and the head was jerked upward.

In the full song the intervals between these double clicks gradually shortened until the sounds almost ran together. This was interrupted by a note which sounded like a cork being withdrawn from a bottle. On 20th April a cock displayed to a hen a yard from the hide in which I was concealed. In every song heard at such close range a deep grunt, which reminded me of the *thump* uttered by a strutting domestic turkey, was emitted at the same time as the "cork" note. I could not hear this when the bird displayed more than seven yards from the hide. I am unable to say whether this sound is produced with the "cork" note in every song or whether it is reserved for high intensity display before a hen.

The third part of the song, which has been likened to the sound of a scythe being whetted, followed immediately. Three or four paired scraping notes were uttered while the bird opened and closed its bill and jerked its head up and back. It tilted its body forward and slightly erected the breast feathers as it uttered these notes. Fuschlberger estimated that this part of the song spanned three to five seconds.

Many Continental writers have commented on the fact that Capercaillie cocks are oblivious to danger, such as the approach of a man, during the "whetting" part of the song. This loss of perception is exploited by Continental sportsmen who move only during this period while stalking cocks during the spring shooting season. There has been some speculation on whether the bird closes its eyes while "whetting". However, I had many excellent opportunities of observing the eyes of one male while it sang, and can say that at no time was this bird seen to close its eyes during the final "whetting" phase of the song. Sometimes it was seen to move the nictitating membrane, but this structure never covered the eye throughout the period of oblivion.

The birds watched on the hill of Sluie in 1960 seldom performed the complete display from trees. They often clicked for some minutes in the early morning from a branch but soon flew down to perform the full song on the ground. Fig. 1 illustrates the posture adopted by a singing male.

The sounds made by a Capercaillie cock during the song display are very subdued and do not carry far. At a distance of 80 yards the "hill" and "east" cocks could be heard "whetting" only under the most favourable circumstances, and at 100 yards only the "cork" note could be distinguished. Hainard and Meylan compared the volume and carrying power of the song to those of some other birds and stated that it is a little less feeble than those of the Redstart (*Phoenicurus phoenicurus*), Yellowhammer (*Emberiza citrinella*) and Whitethroat (*Sylvia communis*).

It might be worth noting here that the Capercaillie and the Stone Capercaillie (*T. urogalloides*) of eastern Siberia are the only grouse in the world which point their heads and bills vertically during the song display. Both these species have unusually broad skulls with a relatively great inter-orbital width. In these characters they are unique among the Tetraonidae. I noticed that while in the courtship posture, with bill pointed upward, cocks were able to follow hens and react to one another in such a way that I believe they suffer from little if any defect of forward vision, that is, under the bill. The two photographs appearing on pages 25 and 30 of Tysk and Parling (1959) suggest that a Capercaillie cock's eyes are so set in its head that it may even possess stereoscopic vision in this plane. At the same time,

while moving in this posture they seem to be remarkably clumsy, tripping over branches and objects on the ground. This suggests that their downward vision during song display is not good.

FLUTTER JUMP DISPLAY

With the possible exception of two North American species, the Sage Grouse (*Centrocercus urophasianus*) of the plains and the Ruffed Grouse (*Bonasa umbellus*) of forests, the males of all grouse perform an aerial display, the function of which is advertisement of territory. Some species commonly utter a loud call in conjunction with this performance. In the case of the Ruffed Grouse, this aerial advertising display has evolved into a terrestrial form in which the bird usually stands on a log and "drums" with its wings. Its near relative, the Eurasian Hazel Hen (*Tetrastes bonasia*), may perform on the ground or in the air.

The Hamerstroms (1960) have summarised the observations of a number of authors on the flutter jumping of Blackcocks and Greater Prairie Chickens. They concluded that "There is general agreement, if no real proof, that flutter jumping serves to advertise the display ground. At the same time there is much evidence that flutter jumping is a response to other birds."

On the hill of Sluie the Capercaillies performed a rather clumsy flutter jump on their territories. The birds usually ran a few paces and launched themselves into the air with loud wing beats, flew some seven to ten yards, and settled. They seldom rose more than about three feet from the ground. There was often a flash of white from the under wing-coverts and axillaries as one took off and landed. No advertising call was uttered in association with this display.

Hainard and Meylan noted that "all the cocks of a display ground normally execute them" (the advertising flights) "at the same time, for when one cock starts to jump, like a command his movement is repeated by all his companions in the neighbourhood" (my translation). It was the movement of other Capercaillies, either cocks or hens, in the vicinity of the display ground which seemed most often to stimulate this activity. For example, on 19th April I noted details of 20 flutter jumps carried out by three males displaying on their territories; this was between 4.07 a.m. when the first activity by a cock was recorded and 6.30 a.m. when I left the hide. A hen flying down to the ground stimulated one display flight. Four hens moving from one tree to another above the display area stimulated six. Two cocks leaving the display area elicited four, and three hens flying away another four. In the remaining five cases I was unable to detect the stimulus. Yearling cocks which did not defend territories were very seldom seen to perform advertising flights.



FIG. 2. First of two postures adopted by the male Capercaillie (*Tetrao urogallus*) during bowing display. When two males are disputing, the one initiating the display moves back two or three quick paces and raises the head and neck. The neck and tail are now both at an angle of about 70° , the bill is tilted slightly upwards and the feathers on the lower neck and upper breast are erected so that their tips stand out to present a ragged appearance (see pages 269-270)

THREAT DISPLAY

Fuschlberger has pointed out the difference between the song posture (*Balzstellung*) and the threat posture (*Zornstellung*), and Hainard and Meylan published a sketch of the latter.

I witnessed the threat display frequently. It was usually adopted when one of the territorial males drove another male from his territory, or when the "south" and "hill" cocks advanced on one another in the unclaimed area between their territories. The posture was similar to that adopted in song display, but the neck was held further forward and the bill was not pointed upward but was retained in a more normal position. The feathers on the lower neck and upper breast were erected. This destroyed the sheen of this part of the bird's plumage and produced a dense black area. This posture was not always adopted under aggressive circumstances, however. The "south" cock was twice seen to drive yearling males out of his territory without ruffling the feathers on his breast.

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BOWING DISPLAY

The display which I have called "bowing" was performed during disputes between males and it appears to be a high intensity threat. I have already mentioned the disputes which took place between the "hill" and "south" cocks in the unclaimed area between their territories. They were crouched with their bills about a foot apart, pecking at one another, when the bird initiating the display moved backwards two or three quick paces and raised its head and neck to an angle of about 70° . The head and bill were tilted slightly above the horizontal. The feathers on the upper back of the neck were slightly erected, but their tips lay flat to present a smooth appearance. On the rest of the neck and on the upper breast the feathers were also erected, but their tips stood out to present a ragged appearance. The beard was fully extended. The tail was also held at about an angle of 70° and was partially folded. Plates 30 and 31b in Andrew (1958), photographed by Kurt Ellström, Enar Sjöberg and Jonas Svensk, illustrate this posture very well. It is not, however, used when the bird utters its song. The song display posture is shown on plate 29 of the same paper.



FIG. 3. Second of two postures adopted by the male Capercaillie (*Tetrao urogallus*) during bowing display. After uttering two guttural calls in the upright position shown in Fig. 2, the bird quickly bows the head and neck forward until they are parallel to the ground and it is crouching. The two calls are now repeated more rapidly, and the whole series of four sounds has been likened to the noise of vomiting

In this upright position (Fig. 2) the bird uttered two guttural calls and, with a quick movement, bowed the head and neck forward until they were close to the ground and parallel to it. In this new position (Fig. 3) the two calls were repeated more rapidly. This series of calls can be represented as *roo-----roo-----roo-roo*. It can be likened to the sound of a person vomiting and, indeed, German authors have named this the "*Wurgen*" or "*Wörger*" call. The entire behaviour pattern took about two seconds to complete and the calls were uttered in about one and a half seconds.

I have already mentioned the performance of this display in an aggressive setting by the non-territorial cock which may not have been a yearling. This bird moved forward about four paces with neck erect and feathers ruffled before uttering the calls. In its case the tail was nearly fully spread and held at an angle of 90°.

Hainard and Meylan describe this behaviour pattern and mention that they have not entirely grasped the very complex meaning ascribed to it by German authors. Fuschlberger reports that the "*Wurgen*" call, with or without the associated movements, may be uttered by yearling males before roosting.

More observation is needed before the significance of this display is fully understood. I have tentatively interpreted it a "high intensity threat display" because it appeared in that setting and seemed to be homologous to a similar display which is performed in like circumstances by the Spruce Grouse (*Canachites canadensis*) (Lumsden in press). The Black Grouse, Greater Prairie Chicken, Sharp-tailed Grouse and Sage Grouse do not seem to have a homologous display.

PRE-COPULATORY DISPLAY

Capercaillie cocks do not seem to have a specialised pre-copulatory display like the nuptial bow of the Blackcock and Greater Prairie Chicken. What would appear to be a pre-copulatory display performed by hens has been described by Fuschlberger. He reported sinuous movements of the neck, the head stretched back until it almost touched the back, then moved sideways, forwards and downwards.

Höglund (1957), writing of captive birds, described the hen moving with short measured steps, her plumage held in close to her body, and making feeble nodding movements with her head, with her beak pointed more and more towards the ground. She finally lay down with outspread wings, her beak resting on the ground.

I did not see any pre-copulatory displays quite like these. Before mating, hens usually squatted on the ground with half open wings. Sometimes one wobbled from side to side or moved the wings in and out from a partially drooped to a half open position. Often the head, slightly lowered and held close to the breast, was turned through a

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45° angle from one side to the other. This soliciting posture was sometimes held for as long as seventy seconds before the cock mounted. On one occasion a hen solicited continuously for about two minutes, but three times moved away a few yards with a quick run before the cock could mount. On another occasion the cock left two soliciting hens to round up a third and drive her into his territory.

MATING

Between 20th and 23rd April I witnessed thirteen copulations. I may have missed some on 22nd April when much display activity took place behind a screen of birches; and on the 25th when a hen spent some time on the ground out of my sight in the territory of the "east" cock. The number of copulations seen each day and the time limits within which they occurred are given in Table 2. Twelve of the matings I saw were performed by the "south" cock and only one by the "hill" cock. Among Black Grouse, Greater Prairie Chickens and Sharp-tailed Grouse, copulation is often interrupted by cocks from adjacent territories. In no case did I see any attempt at interference among the Capercaillies on the "west" display ground.

Before mounting, the cock sometimes performed several full song displays beside a soliciting female. He then grasped the feathers on the back of her head and stepped on to her back. This was carried out in a slow deliberate manner and sometimes with some clumsiness. His tail was half closed and held at an angle of 45°; during the act of insemination it was swung down until it pressed on the ground. There was no violent wing flapping as recorded by Lack (1939) and Höhn (1953) for the Black Grouse.

I had no way of distinguishing the hens which came to the "west" display ground and cannot say if the same ones were mated on successive mornings. On 23rd April one hen was mated twice by the "south" cock, at 5.54 a.m. and 5.58 a.m.

Fuschlberger reports that copulation usually takes place during the hours of the afternoon at "mating grounds" (*Tretplatx*) which may be quite far from the display ground. I have no observations that would support this statement and did not see or flush parties of birds containing both sexes on the afternoons that I spent on the hill.

POST-COPULATORY DISPLAY

Höglund, writing of his captive birds, mentions that after copulation the hen jumped round the cage. Sometimes she attacked the cock, leaping at him and pecking vigorously at his beak and throat. The restraining influence of the pen may have affected the behaviour of these birds, however, for I certainly saw no activity resembling this on the hill of Sluie. After copulation the hen invariably ran a few

paces with her neck extended forward and her neck feathers erected. As she ran she vigorously shook her wings and then stopped to preen. The cock usually resumed the performance of the song display.

SUMMARY

(1) The displays of Capercaillies (*Tetrao urogallus*) were studied at a display ground in Aberdeenshire in April 1960.

(2) Three territorial cocks held territories, the boundaries of which did not touch. Non-territorial cocks were tolerated in the unclaimed area between the territories.

(3) Up to four non-territorial cocks visited the display ground during the period of activity in the early morning.

(4) Up to nine hens visited the display ground at one time.

(5) Copulations were observed between 20th and 23rd April.

(6) Descriptions are given of the song, flutter jump, threat, bowing, pre-copulatory and post-copulatory displays.

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Studies of less familiar birds

112. Little Auk

By P. P. G. Bateson

Photographs by W. Puchalski and G. R. Shannon

(Plates 43-48)

A LARGE COLONY of birds is spectacular in any part of the world, but in the comparatively birdless landscape of the far north the huge

auk colonies are extraordinarily impressive. While in the higher latitudes the land can provide little in the way of food, the sea, unexploited for the greater part of the year, supports dense concentrations of animal plankton in the summer when the small planktonic plants, on which they feed, multiply. In regions north of the Atlantic the principal species to exploit this colossal source of food are the Brünnich's Guillemot (*Uria lomvia*) and the Little Auk (*Plautus alle*). The Little Auk or Dovekie is probably the more common of the two species within its breeding range from the western Palearctic to the eastern Nearctic and elsewhere its numbers are rivalled only by those of the tiny Least Auklet (*Aethia pusilla*) of the north Pacific (Salomonsen 1950, Fisher and Lockley 1954).

The Little Auk breeds almost exclusively in the high arctic zone where its numerous colonies may vary in size from a few hundred pairs to well over a million (at Thule, Greenland). In the low arctic there are scattered groups of only a few breeding birds. These, however, are probably the remnants of much larger colonies that have been depleted as a result of the gradual warming up in the Arctic. There is no doubt that, within the last hundred years or so, numbers in southern Greenland and in Iceland have fallen markedly and some colonies have disappeared altogether (Foster *et al.* 1951, Salomonsen 1950).

Little Auks nest in rock crevices and colonies are thus most often found in screes and in the talus collecting beneath crumbling cliffs. Arctic Foxes (*Alopex lagopus*) can easily clamber about such sites and so the birds nest as far into the collected stones as they can get—often more than a yard from the surface. However, the auks will also breed on cliffs that are sufficiently eroded or fissured and there the nests may be very close to the surface. Colonies may occur at any height from sea-level to over 1,500 feet—well above the snow-line. Although most are fairly near the open sea they can often be found far up valleys and into the fjords (where the birds do not usually feed); Longstaff (1924) mentioned a colony that was 20 miles inland.

The lower colonies can often be detected from a great distance, as Lovenskiöld (1954) points out, by the thick growth of yellow-green moss beneath them; this is mostly *Dicranum*, according to Salomonsen. Sometimes the higher colonies are also conspicuous from afar, when the snow around them has been stained red with droppings. As one gets closer, screams of seemingly hysterical witch-like laughter are brought on the wind and the birds themselves look rather like swarming insects as their flocks wheel in front of the colony (plate 46a). The laugh-like call, a shrill, descending chatter, is given only in the breeding season; it is noticeably "contagious" and when one bird calls others are also stimulated to do so. This description probably covers a variety of differently motivated calls; however, the one given as the birds wheel

in front of the colony appears to be associated with fear of a possible predator.

Although the Little Auk can be quite tame and is thus not a difficult bird to watch at some of its more accessible colonies, surprisingly little is known about its behaviour. The birds begin to arrive on their breeding grounds in April and May (Clarke 1898, Salomonsen 1950), but after spending a short while at the colony they depart for the sea and return again a few days later; such flights from the colony are repeated several times. This sort of behaviour seems to occur in many sea-birds at the beginning of the breeding season. To begin with, the Little Auks are clearly frightened when they land in the colony-to-be, but the fear gradually wanes or becomes subordinated to an increasingly strong drive to reproduce. By the beginning of June they have settled permanently in their colonies and the first eggs are laid about ten days later. Nothing is known about pair-formation, but Foster *et al.* (1951) describe a display which may be a part of courtship. The birds face one another, bow and then shake their heads, probably rubbing bills as they do so.

Normally only one egg is laid; this is incubated by both sexes. The chick (plate 47b) remains within the nest hole until a few days before it is due to depart from the colony in the latter half of August. At the end of the fledging period many chicks are to be seen at the hole-entrances flapping their wings; needless to say, at the slightest sign of any danger they scuttle back inside.

Not surprisingly, the Little Auk, numerous as it is, has attracted a large number of predators. Of these the most persistent and devastating are the Glaucous Gull (*Larus hyperboreus*) (plate 47a), the Arctic Fox and, in Greenland, Man. Most colonies of any size have at least a few pairs of Glaucous Gulls nesting near-by. The auks are really safe only in their nest holes, for the big gulls can catch them on the wing with comparative ease. If an auk attempts to escape by diving into the sea, its pursuer has been seen to hover over the surface watching its progress under water and attacking it as soon as it comes up for air (Bent 1919); more commonly, however, the gull settles on the sea and appears somewhat mystified when the Little Auk surfaces some twenty yards from it. The gulls take their greatest toll from the recently fledged birds, evidently finding them much easier to catch on the wing (Lovenskiöld 1954). Thus there is a strong premium on a synchronised departure from the colony by the young auks. The Arctic Fox manages to dig out a few nests, but also lies in wait in the colony and pounces on incoming auks. The foxes are so successful that Braestrup (1941) believes that in districts such as Thule in Greenland, where the Little Auk is particularly abundant, they feed exclusively on these birds in summer; they even build up caches of dead

auks that provide a large part of their winter food as well. Like the Glaucous Gull and the Arctic Fox, some of the Greenland Eskimos are almost entirely dependent on the Little Auk colonies for food (Salomonsen 1950). Other less important predators are the Arctic Skua (*Stercorarius parasiticus*) and, in Greenland, the Gyr Falcon (*Falco rusticolus*) and Raven (*Corvus corax*). Nor is the Little Auk safe in the sea where it is liable to be snapped up by large fish and seals; it has even been found in the stomach of the White Whale (*Delphinapterus leucas*) (Bent 1919).

At sea the Little Auk is found most commonly near the pack ice where the small planktonic Crustacea on which it feeds (principally Copepoda, Mysidacea, Amphipoda and Euphausiacea) are most plentiful. When the bird dives in search of food it usually stays submerged for about half a minute, during which time it may swim a considerably horizontal distance while remaining comparatively near the surface. The majority of the planktonic animals on which the Little Auk feeds rise to the surface waters only during the night (see Hardy 1956) and, indeed, at their colonies the birds do appear to be coming and going more frequently at that time; Foster *et al.* (1951) found that in Iceland the auks were most active between 10 p.m. and 4 a.m. In the continuous daylight of the Arctic summer the detection of plankton would not be such a problem, but it is not known how the birds find their food on winter nights. By whatever means the plankton may be caught, it is collected in a pouch opening beneath the tongue. This throat pouch, which can be greatly distended with food (plate 44b), is very noticeable in plates 43-45. The similar pouches that are found in other auklets (*Aethia*) (Portenko 1934) are probably homologous. Since this is one of several characters that are shared by the Little Auk and the auklets, there may be closer affinities between these species than is suggested by spreading them among several genera.

In the Antarctic the niche occupied by the auks in the Arctic is filled by the diving petrels (Pelecanoididae) (Murphy 1936). The convergence between the two groups is remarkable, but especially striking is the similarity between the Little Auk and the Magellanic Diving Petrel (*Pelecanoides magellani*). Not only are both species highly adapted for feeding under water, but also the petrel's plumage bears a marked resemblance to the winter plumage of the Little Auk.

The details of the Little Auk's summer plumage can be seen clearly in plates 43-45. The winter plumage is illustrated by plate 48; the black (really very dark brown) feathers of the throat, breast and ear-coverts are replaced by a rather smudgy white. Although the rapid wing beat is typical of the auks (giving the illusory impression that they are flying very fast), the Little Auk, as *The Handbook* points out,

looks almost like some odd Passerine at a distance. This, together with the combination of small size (plates 43 and 48) and stumpy bill (plate 44a), make mis-identification unlikely. Nevertheless, an inexperienced observer might be misled by immature Puffins (*Fratercula artica*) and Razorbills (*Alca torda*) which have much smaller bills than the adults; even so, their bills are not short and stumpy.

By the beginning of September the Little Auks have all departed from the colony and are gradually moving south. Although they winter up to the southern limit of the firm ice they begin to appear in the middle of the Atlantic by mid-October and enormous numbers winter over the Grand Bank of Newfoundland (Rankin and Duffey 1948). According to Rankin and Duffey, the Little Auk avoids the Gulf Stream, presumably because the warm current is much poorer in plankton.

Small numbers of Little Auks occur round British coasts throughout the winter, but the majority of ornithologists are likely to come across them only at the time of their "wrecks" when odd ones can even occur far inland. The associated "flights", when large numbers of birds migrate south, are seen much more clearly on the eastern coast of the United States (Snyder 1953). The ultimate cause for the flights and wrecks, which occur only at the southern limit of the winter range, is still not properly understood. The proximate cause for the wrecks is almost certainly high wind. This causes turbulence in the surface waters where the auks feed and, as a consequence, the plankton do not come up so far in their daily vertical migrations. A failure in food supply would account for the starved condition of the wrecked birds, as Murphy and Vogt (1933) and Sergeant (1952) have suggested. However, Murphy and Vogt obtained evidence that birds found in the early stages of the 1932 wreck, which lasted for several days, were not starved. The explanation might be that the auks normally allow themselves to drift with the storm, but, on finding themselves up against a lee-shore, attempt to battle against the wind and draw fatally on their stores of energy. Probably the indirect effect of the wind, through the food supply, and the direct effect on the birds themselves both play a part. All this does not explain why wrecks do not occur in the northern part of the wintering range where storms are, if anything, more common, or why the Little Auks should move south from their normal wintering area to more temperate latitudes in some years and not in others. Murphy and Vogt suggested that there might be a periodic build up in the Little Auk's numbers that could be relieved only by a destructive migration southwards comparable to the mass movements of the Lemmings (*Lemmus lemmus*). However, Fisher and Lockley (1954) analysed the occurrence of flights and wrecks and found that they were quite irregular so that this explanation



PLATE 43. Little Auk (*Plautus alle*), Spitsbergen, July 1957—little larger than a Starling (this is near life size), black and white but for deep brown head and breast. Its short neck, stumpy bill and food-packed throat give it a frog-like look. The set-back legs are an adaptation to marine life (pages 272-277) (photo: W. Puchalski)



PLATE 44. Little Auks (*Plautus alle*), Spitsbergen, July 1957. The close-up shows the small bill, the dense feathering typical of water birds, and the patch which, from afar, looks like the white of the eye. Below, full and empty throat pouches show how much food can thus be carried (page 275) (photos: W. Puchalski)





PLATE 45. Little Auks (*Plautus alle*), Spitsbergen, July 1957. Above, pair in two common rest attitudes, on the tarsi and on the belly; male and female look alike. Below, scapulars are lined and secondaries tipped with white; wings seem long in flight, but actually do not extend beyond the tail (photos: W. Puchalski)





PLATE 46. Little Auks (*Plautus alle*), Spitsbergen, July 1957. A fraction of the colony wheeling round; colonies may number many thousands (page 273). The slender wings move very fast and give a false impression of speedy flight. Below, off-duty birds grouped in the sun on rocks near the colony (photos: W. Puchalski)



PLATE 47A. One of the most serious predators of Little Auks (*Plautus alle*) is the Glaucous Gull (*Larus hyperboreus*); this bird can easily catch them on the wing. Nearly every colony is terrorised by at least a few pairs nesting not far off (page 274)



PLATE 47B. Young Little Auk a few days old (note the egg tooth). It is brown-black above and on the throat, and paler below. It has been taken from the unlined crevice which serves as the nest, deep in the talus (page 273) (photos: W. Puchalski)



PLATE 48. Little Auk (*Plautus alle*) in winter, Kent, December 1955. Now the breast, throat and ear-coverts are a rather smudgy white, though this colour is often purer than it appears here. The white eye-patch, scapular streaks and tips to the secondaries stay the same. Comparison with the two hands illustrates the small size (*photos: G. R. Shannon*)





PLATE 49. Bald Robin (*Erithacus rubecula*) and two Blue Tits (*Parus caeruleus*) at a feeding post, Hertfordshire, February 1961. The Robin died four days later and a post-mortem examination showed an unidentified fungus on the head and chin. The bird, a female, was in a very poor condition and it is not known if the fungus was the cause of death or purely secondary (pages 289-290) (photos: Eric Hosking)

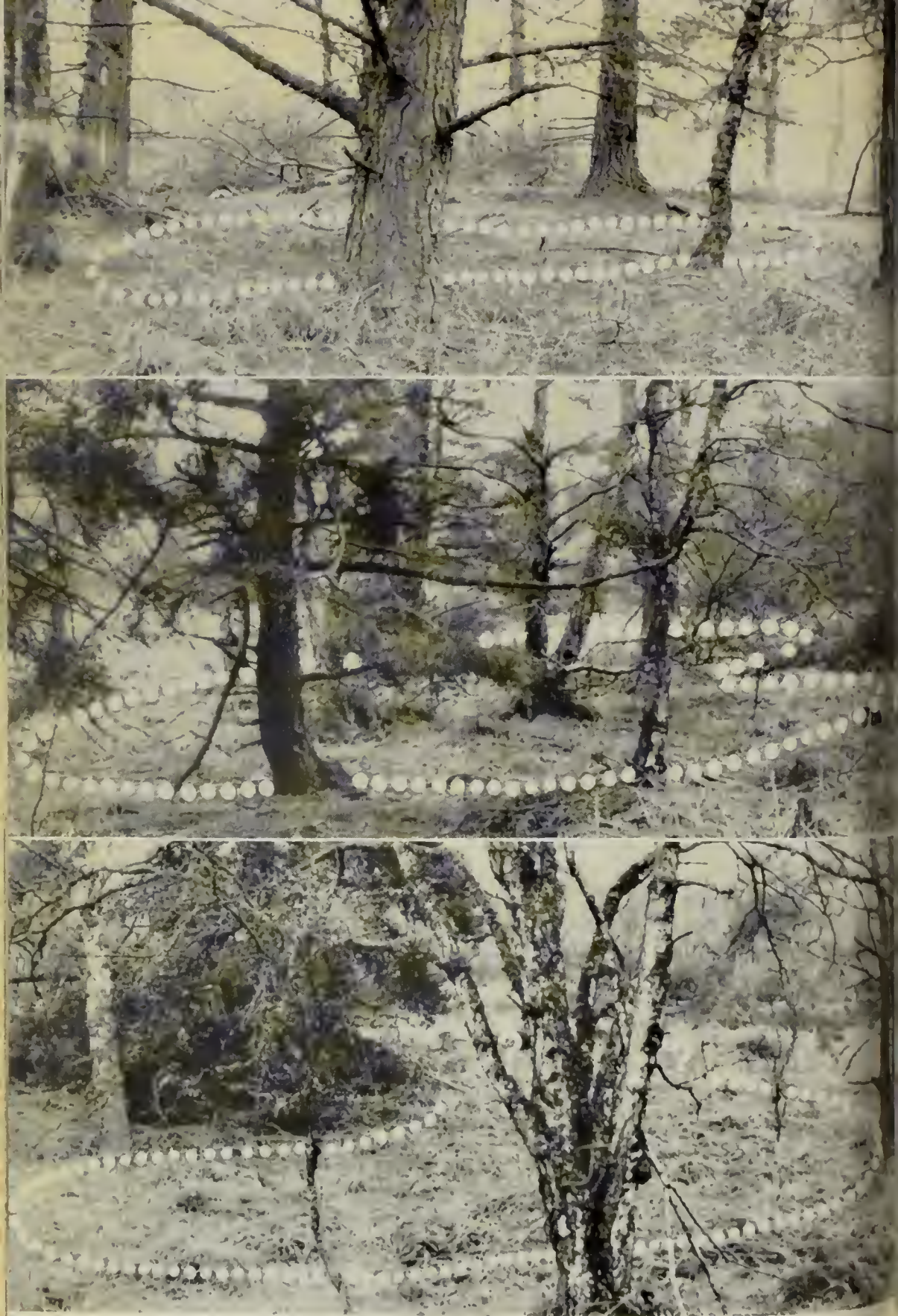


PLATE 50. Display grounds of male Capercaillies (*Tetrao urogallus*) in pine, birch and larch area, Aberdeenshire, April 1960 (pages 257-272). The topmost one (named "south") measured 10 yards by 30, each of the other two ("hill" and "east") 25 by 40; 20-40 yards of unclaimed terrain separated them (photos: H. G. Lumsden)

would appear to be unlikely. Possibly prolonged bad weather in the North Atlantic and the consequent shortage of food drives the birds south. Other factors not directly connected with storms might adversely affect the planktonic population so that there was no longer enough food to support all the auks in their normal wintering area. Whatever the cause, the active southerly movements (the flights) are well known (Snyder 1960); these may or may not be followed by a wreck. In warmer waters the concentration of plankton is lower and more patchy and although the immigrants probably survive in calm weather a storm, which would not seriously affect them further north, might cause their mass destruction in temperate latitudes.

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Sex and age counts of wintering thrushes

By J. H. Phillips

THE SERIES OF sight-record sex counts of wintering Blackbirds (*Turdus merula*) given by the Venables (1961), taken with those quoted in their previous paper (1952), provide interesting evidence for what would appear to be a wide-spread phenomenon in Britain—a preponderance of males between November and February. The collection of sight-records, however, has certain limitations and, indeed, drawbacks

from the point of view of analysis. The greater conspicuousness of males, for example, introduces an unknown error, and, in addition, accurate ageing of birds is impossible. Some of the records quoted were taken from several years, so that no account is taken of possible annual variation. Records of birds caught in conventional traps may also be unreliable, as indicated by Lack and Light (1941) who argue that, by analogy with Robins (*Erithacus rubecula*), male Blackbirds may enter traps more freely than females. It is possible that even bat-fowling records may be misleading, owing to sexual segregation in roosts, unless a sufficiently large sample is taken. It is therefore of considerable interest that the records cited below, which were all obtained by the operation of scattered mist-nets, agree very closely with the results given by Venables.

Mist-netting would appear to be an excellent method of obtaining completely random samples of a given population of a species. Fulbourn Fen, at Little Wilbraham in Cambridgeshire, contains several areas of thorn bushes which provide an ample food supply for a number of Redwings (*T. musicus*) and Fieldfares (*T. pilaris*) during October, and which are used by these species and Blackbirds and Song Thrushes (*T. philomelos*) as a roost during this and subsequent months, the numbers falling off again during January. Mist-nets were used there on five occasions between the end of October and the beginning of December 1960 and twice during January 1961, birds being taken mostly between the bushes at dusk while flying to the actual roost.

C. J. Mead has kindly provided records of birds caught in a similar way at Coton, Cambridgeshire. Here there was a roost of Song Thrushes and Blackbirds in an area of thorn bushes about 20 yards wide and 250 yards long between two fields. Mist-nets were sited at intervals across the hedges and lines of bushes leading towards the roost.

The birds caught were examined in the hand, and were aged and sexed as far as possible by the characters given in *The Bird in the Hand* (Cornwallis and Smith 1960). Thus, using the colour of the greater coverts, birds with "outer (unmoulted) feathers paler than new inner ones" were considered to be in their first winter, whereas males with uniformly black and females with uniformly dark olive-brown greater coverts were considered to be adult. Snow (1958, p. 23) states that "the change of the beak and eye-rim to yellow in the male normally takes place in the course of the first winter, but the exact time varies a great deal. Some young males show yellow at the base of the beak in September and have fully yellow beaks by the end of November: others still have dark beaks in March." This character was not used for ageing. Wing colour, although it has been shown by retrapping to be not an absolutely rigid criterion, would seem to be considerably

SEX AND AGE RATIOS OF THRUSHES

TABLE 1—NUMBERS OF BLACKBIRDS (*Turdus merula*) CAUGHT AT FULBOURN FEN, CAMBRIDGESHIRE, IN THE WINTER 1960-61

Ringers were S. Boddy (SB), S. L. B. Lee (SL), C. J. Mead (CM) and J. H. Phillips (JP). Abbreviations used in this and other tables are the standard ones for adult (ad.), first-winter (1stW.) and full-grown but of uncertain age (f.g.)

Ringers	Date	Ad. ♂	Ad. ♀	1stW. ♂	1stW. ♀	F.g. ♀	Total
JP, SL	30 Oct.	2	1	13	8		24
JP, SL	6 Nov.	11	10	17	13	2	53
CM, SB	8 Nov.	2	4	11	2	2	21
JP, CM	12 Nov.	7	3	15	6	1	32
JP	6 Dec.	2	3	7	4	1	17
CM, SB	15 Jan.	3	6	10	5		24
CM, SB	16 Jan.	6	8	13	3		30
Totals		33	35	86	41	6	201

more reliable. It is unlikely that any second-winter birds were included in the first-winter total, as Snow indicates that the moult is usually complete in September. In addition, no birds ringed as "first-winter" were retrapped as "adult" in the spring.

Full data for seven visits to Fulbourn between the end of October 1960 and the middle of January 1961, and of fifteen visits to Coton between the end of October 1960 and the end of February 1961, are given in Tables 1 and 2. The figures in these tables include all Black-

TABLE 2—NUMBERS OF BLACKBIRDS (*Turdus merula*) CAUGHT AT COTON, CAMBRIDGESHIRE, IN THE WINTER 1960-61

Ringers were S. Boddy (SM) and C. J. Mead (CM). Age abbreviations are as given in Table 1

Ringers	Date	Ad. ♂	Ad. ♀	1stW. ♂	1stW. ♀	F.g. ♂	F.g. ♀	Total
CM, SB	27 Oct.		2	8	2		1	13
CM, SB	28 Oct.	1		9	1	1		12
CM, SB	30 Oct.	1	2	12	9			24
CM, SB	5 Nov.	5	1	13				19
CM, SB	6 Nov.	5	3	19	13		7	47
CM, SB	10 Nov.	4	8	19	11		5	47
CM, SB	19 Nov.	7	1	34	6		2	50
CM, SB	21 Nov.	2		7	7		2	18
CM, SB	28 Nov.	1	4	12	5		2	24
CM, SB	14 Jan.	7	6	15		1	7	36
CM, SB	20 Jan.	8	4	20	9	1	7	49
CM, SB	23 Jan.	8	4	11	7		3	33
CM, SB	12 Feb.	7	6	28	5		7	53
CM, SB	15 Feb.	4	4	3	2		4	17
CM, SB	23 Feb.	4		8	3		2	17
Totals		64	45	218	80	3	49	459

birds caught, the proportions of retraps being 9.7% at Fulbourn and 27.7% at Coton.

It will be seen that it was not possible to age a number of the females with confidence, these being given as "f.g.". These amount to 7.3% of the total number of females caught at Fulbourn, and 28.2% of the female total at Coton (although only 3.0% and 10.7% of all the birds trapped). Consequently a grave error was introduced into the calculation of quantities involving knowledge of the female age ratio, so much so that these calculations for Coton birds are virtually worthless and have been enclosed in brackets in Table 3, which summarises the age and sex percentages.

The range of values for the percentage of males given in the two papers by the Venables is, excluding samples of less than one hundred birds, 53.9% to 65.6%. The fact that the figures obtained by mist-net sampling lie well in the middle of this range is an indication of the efficacy of the census methods used by the other workers. There is strong disagreement with the percentage of first-winter males, however, although there is agreement on this between the Fulbourn and Coton figures. The range of figures for the percentage of first-winter birds in the male total given by Venables (1961) is 34.8% to 46.2%, a ratio of 2:3, whereas the mist-netting figures show an average adult male to first-winter male ratio of 1:3. This may be due to the unreliability of the bill as an ageing character.

It would appear that there is very approximately a 1:1 sex ratio in the adults, and that the sex disparity is found among the young birds. In this connection W. D. Campbell's results in Venables (1952) are of interest: of 180 adults obtained by bat-fowling, exactly 90 (50.0%) were male; but of 99 first-winter birds, at least 63 (63.6%) were male. These results are contrary to those quoted by Lack (1954, p. 109), which indicate that the sex disparity is to be found in the adult, but not the yearling, population.

TABLE 3—AGE AND SEX PERCENTAGES OF BLACKBIRDS (*Turdus merula*)
IN TABLES 1 AND 2

Age abbreviations are as given in Table 1. Birds listed in Tables 1 and 2 as "f.g." have been excluded here, so that all "% 1stW." figures are the first-winter percentages of the ad.+1stW. total. At Coton "f.g." birds formed such a high percentage of the female total as to make the percentages in brackets of very doubtful value (see text above)

	% ♂	% 1stW.	% 1stW. ♂ of all ♂♂	% 1stW. ♀ of all ♀♀	% ♂ of all ad.	% ♂ of all 1stW.
Fulbourn	59.2	65.1	72.3	53.9	48.5	67.7
Coton	62.1	(73.2)	77.3	(64.0)	(58.7)	(73.1)

SEX AND AGE RATIOS OF THRUSHES

TABLE 4—NUMBERS OF BLACKBIRDS (*Turdus merula*) RETRAPPED AT COTON, CAMBRIDGESHIRE, IN THE WINTER 1960-61

	Total number caught at Coton	Retraps of birds ringed at Coton	Retraps of birds ringed elsewhere
Males	285	47	35
Females	174	39	6

Drost (1935) shows that females predominate over males as migrants at Heligoland, in the ratios 3:2 in autumn and 2:1 in spring; and, as the male preponderance seems to be general throughout the British Isles, it may be found that females predominate in some places on the Continent. Drost's figures for adult to first-winter ratios were:

(autumn) ♂♂ 100:182.4 ♀♀ 100:168.0
(spring) ♂♂ 100:140.9 ♀♀ 100:90.8

These are in fair agreement with the Cambridge results.

It is perhaps relevant that Lack has calculated (on the basis of ringing results up to 1934) that the average annual mortality rate of Blackbirds ringed in Britain in winter is slightly greater for females (50%) than males (46%).

C. J. Mead, assisted by S. Boddy and S. L. B. Lee, has carried out a statistical analysis of the Blackbird samples obtained at Coton, using χ^2 significance tests. The ratio of adult males to first-winter males was significantly greater in spring (January and February) than in autumn (October and November) ($P=0.05\%$). The figures for females were, unfortunately, not amenable to analysis, but there was no significant alteration of the total male to female ratio throughout the period. The retrap figures were also analysed. About four hundred Blackbirds were ringed during the winter at three other roosts within a mile of Coton, and a number of exchanges between roosts occurred. The number of retraps of birds from other roosts at Coton thus increased markedly during the season, and it was found that many more males than females, in proportion to the male to female ratio for the whole population, were among these ($P<0.01\%$). The numbers of retraps are shown in Table 4.

These results indicate that males are more likely to move around locally than females, although the general sex ratio remained constant. The increase in the ratio of adult males to first-winter males during the season indicates either an exodus of first-winter males, balanced by an exodus of first-winter females to maintain the sex ratio, or an influx of adults. To explain these figures simply by a differential mortality rate between adult and first-winter males, over half the first-winter

males alive in mid-November would have had to have died before the end of January, in a ten-week period. Lack (1954, p. 83) shows that first-year birds do have a higher winter mortality rate, but that this is not generally greater than about 30% above the adults' over a six or eight month period from September. In fact he has shown elsewhere (Lack 1946) that, after November, first-year Blackbirds have a mortality rate per annum only 5% above that for adults.

As far as other Turdidae are concerned, a number of Redwings and Fieldfares were also aged and sexed at Fulbourn Fen during the winter of 1960-61, the characters used again being those given in Cornwallis and Smith (1960). Of 63 Redwings, ten were adult and 53 first-winter, giving a ratio of 1: 5, and of 51 Fieldfares, 16 were adult and 35 first-winter, giving a ratio of 1: 2. Meanwhile, of 47 Fieldfares which were sexed, 34 were females and only 13 males, a male to female ratio of 2: 5. Although the samples are too small for firm conclusions, the adult to first-winter ratio of the Redwings and the sex ratio of the Fieldfares differ considerably from the corresponding Blackbird figures (1: 2 and 3: 2), although the Fieldfare age ratio is the same. It is uncertain whether this represents a real difference or whether the characters used for ageing and sexing the Redwings and Fieldfares were inaccurate criteria.

At Coton 169 Song Thrushes were caught at the same time as the Blackbirds and only 10% of these were retraps. The retrap rate was significantly different from the Blackbird rate ($P < 0.01\%$). Coupled with the fact that many more Blackbirds were caught, this suggests that the population was a very mobile one, a conclusion supported by a consideration of the ratio of Song Thrush to Blackbird numbers, which varied from 0.94 in October to 0.21 in late November, but had increased to 0.41 in January.

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Notes

Hudsonian Whimbrel on board ship in the eastern Atlantic.—On 24th August 1960, a Hudsonian Whimbrel (*Numenius phaeopus hudsonicus*) was seen on board the S.S. *Birmingham City* during a crossing of the Atlantic from west to east. I first noted it at 0600 hours when the position of the ship was $50^{\circ}21'N$, $14^{\circ}23'W$, or 191 miles west of the Fastnet light, Co. Cork, and it remained with us for over nine hours, during which time we were travelling at an average speed of $9\frac{1}{2}$ knots. It spent most of the day on the deck, flying very occasionally and only when disturbed. It would allow approach to within a few feet and its flight was very weak. It was, therefore, easy enough to note the plumage characters which distinguish this unmistakable race—the combination of a typical Whimbrel head pattern and a dark rump. It was a size smaller than a Curlew (*N. arquata*), with a shorter and straighter bill; its legs were blue-grey. A clear longitudinal buff stripe on the crown was bordered on either side by a dark brown line. The wings, back and tail were brown, spotted with whitish buff; the primaries were black with white central vanes.

It was on one of the occasions that it was disturbed that it met its end. After flying around it tried to land on board again but hit the side of the ship and fell to the water. There it floated, partially submerged, with wings half outstretched and head just above water; it seemed unable to move, and was not seen again. This took place at 1510 hours, when the position of the ship was $50^{\circ}52'N$, $12^{\circ}15'W$, or 105 miles from Fastnet.

STEPHEN CHAPMAN

[Mr. Chapman has kindly supplied two photographs of the bird and these completely confirm his identification. There is only one fully authenticated British record of this very distinctive North American race of the Whimbrel and that was on Fair Isle in May 1955 (*Brit. Birds*, 48: 379-381.—EDS.)]

Ruff displaying to Spotted Redshank and Long-tailed Skuas.

R. G. H. Cant recently described an interesting record of a Ruff (*Philomachus pugnax*) displaying to a Knot (*Calidris canutus*) in Suffolk in July (*Brit. Birds*, 54: 205). I watched similar behaviour by a Ruff on the Sautso plateau in northern Swedish Lapland on 15th June 1949, but on that occasion the partner was a Spotted Redshank (*Tringa erythropus*) which showed no reaction whatsoever to the other bird's posturing during the ten minutes or so that it lasted. This Ruff made no attempt to copulate as in the case witnessed by Cant, but performed before and around the Spotted Redshank, as it does in

front of another male of its own species, executing its whole repertoire of "fighting" display attitudes. The presence of the solitary Spotted Redshank thus released in the Ruff the phases of display behaviour which are connected with encounters between males, while in the other case a Knot "in full summer plumage" released in the Ruff a characteristic courting display as before a Reeve, followed by the offering of pieces of vegetation and feathers, as well as attempts to mount.

Single Ruffs sometimes display towards the Long-tailed Skuas (*Stercorarius longicaudus*) which share their habitats in Swedish Lapland, but the skuas are invariably quite indifferent. I have also seen solitary Ruffs displaying quite by themselves, going through all the postures, jumps and so on as if they were fighting with an invisible adversary. Thus the innate display urge in the Ruff may be so strong that a lone individual does not necessarily need any external releaser in the form of congeners or other birds.

KAI CURRY-LINDAHL

Black-headed Gulls feeding in conjunction with Goosanders.—A flock of nine or ten Goosanders (*Mergus merganser*), all brown-headed birds, spent much of December 1959 and January 1960 on some gravel-pits at Little Paxton, Huntingdonshire, where there is an abundant supply of coarse fish. On 15th and 17th January, I watched them feed at close range. The flock acted coherently, all the birds diving at the same moment and all moving in the same direction, though inevitably coming up at varying intervals. On the first occasion a Black-headed Gull (*Larus ridibundus*) was showing great interest in the feeding Goosanders, and on the second there were three in attendance. The gulls remained on the surface, picking up small titbits that seemed to appear as a result of the mass diving of the ducks. If the latter surfaced away from them, they would quickly rise and settle among them again, following them wherever they went. There was no sign of aggression or resentment by either species, although when a Goosander surfaced almost underneath one of the Black-headed Gulls, both appeared momentarily startled.

C. F. TEBBUTT

[Behaviour of this kind is not uncommon with gulls and Red-breasted Mergansers (*M. serrator*), but it seems that it has seldom been described.—EDS.]

Brünnich's Guillemot in Lancashire.—On 15th April 1960, I picked up a dead Brünnich's Guillemot (*Uria lomvia*) on the tide line at Middleton Sands, near Morecambe, Lancashire. It was an adult in winter plumage and when found was in fair condition except that it was slightly oiled on the upper-parts. The body was quite intact, though the tail appeared to be slightly worn and the eyes had either decon-

posed or been picked out. Later that afternoon I informed a friend, Michael T. Rigby, and together we examined the bird, making the following detailed description:

Upper-parts: whole crown and nape blackish-brown, this cap extending well below the eye to the level of the gape; feathers on mandibles reaching to nostrils; lores and ear-coverts blackish; hind neck, mantle, back and rump blackish-grey; tail more blackish-brown; scapulars and whole of upper wing uniform blackish-brown, except inner webs of primaries which were dusky white and secondaries which were broadly tipped white. *Under-parts:* chin and throat white; feathers at edge of chin black; remainder of body pure white; leading edge of under-wing streaked and spotted medium brown; underside of flight feathers silvery-brown; rest of underwing white; axillaries white, tipped brown. *Soft parts:* bill mainly black, but gonys and tips of both mandibles horn-coloured; from the nostril to the gape along the cutting edge of the upper mandible was a prominent bony ridge which was whitish in colour, inclining to yellow at the angle of the gape; inside of mouth medium yellow; toes and inside of tarsus pale yellow-brown, with outside of tarsus darker, "ankle" blackish and webs blackish-brown; claws black. *Measurements:* bill (feathers to tip) 37 mm., greatest depth (across nostril) 15 mm., length of ridge along cutting edge of upper mandible (nostril to gape) 37 mm., length of gonys 22 mm.; tarsus 38 mm.; tail (rather worn) 40 mm.; wings 220 mm. (right) and 222 mm. (left). *Wing formula:* 2nd primary longest, 3rd 6 mm. shorter, 4th 14 mm. shorter, 5th 24 mm. shorter, 6th 34 mm. shorter.

The head was wedge-shaped, with the crown flat and a gentle slope to the upper mandible. The bill was comparatively short and thick, and strongly decurved towards the tip of the upper mandible. Indeed, the short thick head and bill were the bird's most striking feature. Otherwise, its shape was typical of a guillemot. It had a long neck and body, with a relatively short tail, long narrow wings, and legs set far back. Its total length from bill to tail was about 16 inches.

This is the first record of Brünnich's Guillemot in Lancashire and it also seems to be the first for the western side of Britain. Unfortunately, the corpse was in poor condition after we had finished with it and we considered it too far gone to be worth preserving. The under-parts became discoloured and the feathers of the neck very ruffled. After two days the bird began to smell strongly and we had no alternative but to dispose of it. However, I took the precaution of photographing it before doing so and I believe the results confirm the identification.

K. E. HAGUE

[It is most unfortunate that there was no attempt to preserve this bird or any part of it. The identification of this species is not always as foolproof as might be imagined from *The Handbook*, even with the specimen in the hand. In 1946, R. Wagstaffe and K. Williamson published a paper on "The invalidity of some early records of Brünnich's Guillemot in Britain" (*North Western Nat.*, 21: 20-26) and in it they drew attention to the fact that long immersion in sea water causes

a contraction of the skin at the base of the bill of the Guillemot (*U. aalge*), with the result that a whitish "ridge" is exposed along the tomtia. The effect produced is not unlike the white line along the edge of the base of the upper mandible of Brünnich's Guillemot, and confusion has certainly resulted in the past. The bird in the foreground of the illustration of Brünnich's Guillemot in T. A. Coward's *The Birds of the British Isles* (vol. 3, plate 105) is clearly painted from a mis-identified skin of the commoner species. In the present case, the detailed description by itself is barely adequate and the bill measurements are well within the range of *U. aalge*. Indeed, were it not for the photographs, which unfortunately are not good enough for reproduction, it might not have been possible to accept this record. Luckily, however, the photographs prove that the shape of the bill, particularly the steep slope of the lower mandible between the tip and gonys, was that of *U. lomvia*, and that the feathering extended from the base of the bill to the gonys, which it does not do in *U. aalge*. In addition, the photographs show no evidence of even the slightest streaking on the flanks, while the pattern of white on the side of the head is correct for *U. lomvia* and shows no sign of being crossed by the dark curve which is such a feature of the commoner species in winter plumage.

We repeat, therefore, that this record could hardly have been accepted without the photographs, which goes to illustrate how important it is that people who find unusual birds dead should make sure that as much as possible of the specimen is preserved. Several museums are very glad to receive such material, but anyone who is in doubt is asked to send the remains to Alfred Hazelwood, Museum and Art Gallery, Bolton, Lancashire. If the body is in too bad a state to send by post, an attempt at skinning should be made. Even a rough skin is better than none at all. If skinning is impossible, then such parts of the body as head, wings and legs should be saved. A last resort with smaller species is to preserve the body in industrial spirit or 70% alcohol.—EDS.]

Bee-eaters diving into water.—With reference to my previous note on Bee-eaters (*Merops apiaster*) diving into water, and the observations of others which followed (*Brit. Birds*, 53: 130-131, 222 and 404-405), I should like to record that C. Benson and I witnessed a further instance of this behaviour at a small dam on the Leopardshill Ranch some thirty-five miles south-east of Lusaka, Northern Rhodesia, on 4th December 1960. This dam is surrounded by a belt of low reeds 40-50 yards wide, which in turn is surrounded by scattered acacia scrub. A flock of about twenty Bee-eaters were perching on a couple of the acacia bushes and were making short glides to the water, plunging in but not submerging, then quickly returning to their

perches, only to repeat the performance again and again until they were frightened off by our approach. It appeared that they were feeding because one bird, after rising from the water, dropped some thing and immediately turned to plunge in after it; it evidently recovered the object for it was seen to be swallowing something as it flew off. However, it should be added that we noted only one other bird swallowing.

A. J. TREE

Swallows rearing brood in Spotted Flycatchers' nest.—In late May 1960, a pair of Swallows (*Hirundo rustica*) returned to the garage of a house at South Benfleet, Essex, where they had nested for the previous two years. The owners of the house went on holiday for three weeks. When they returned, they found the Swallows' nest on the ground. Meanwhile a pair of Spotted Flycatchers (*Muscicapa striata*) had built their nest on the flat top of a brick pier supporting a verandah at the rear of the house. The eggs from this nest were found smashed on the stone floor a day or two later. Immediately afterwards, the Swallows took possession of the flycatchers' nest without adding any mud or other material. I saw it in the first week of June when four eggs had been laid, and again in early July when the young were well-feathered and almost ready to leave. By this time the nest had completely disintegrated from their activities (young Swallows spend nearly twice as many days as young Spotted Flycatchers do in the nest) and not a vestige of the material remained. The chicks were left sitting on top of the bare bricks, but they fledged safely.

H. R. TUTT

Blue Tits roosting in street lamps.—The street lighting in Salisbury, Wiltshire, is by sodium discharge lamps. The original installation covered the whole city and was complete by September 1939. For minor roads, lanterns are mounted 15 feet above the road and have 60 watt lamps. These lamps are held in a horizontal plane and have a reflector plate above the bulb. There is a gap of about two inches between this plate and the lantern roof and sides. This space is used as a roosting-site by Blue Tits (*Parus caeruleus*), as shown in Fig. 1.

Observations were made at a circuit of 34 lamps in Bouverie Avenue and Francis Way during August, September and October 1959. On each of the 41 days on which this was done, at least eight of the 34 lamps were occupied. On 13 occasions no less than twelve had Blue Tits in them. The highest number of birds found during August and September was 13, but there was a marked rise during October and on eight of the 14 days in that month when observations were made, 14 or more of the lamps were occupied; there was a maximum of 19 on 26th October. Two lamps were occupied on each of the

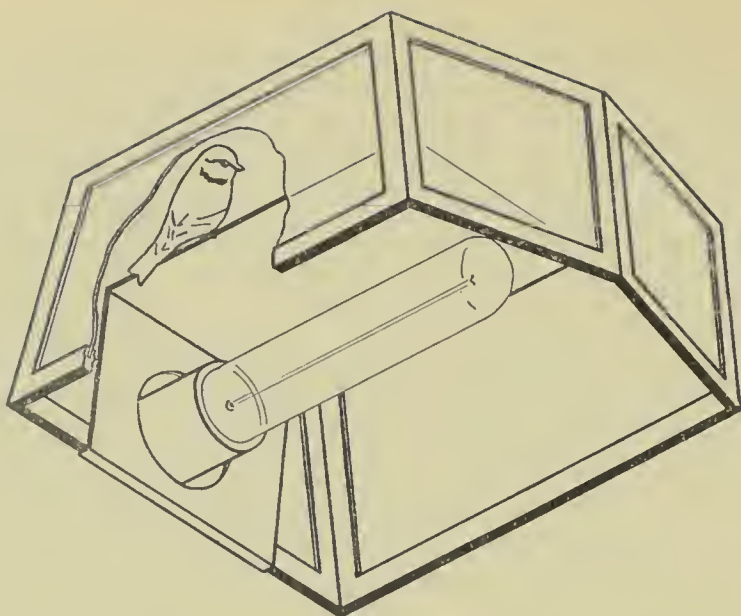


FIG. 1. Part section of street lantern used in Salisbury, Wiltshire, to show position of roosting Blue Tit (*Parus caeruleus*) on reflector plate

41 days. The average number of birds present in August (13 days) was 11.2, in September (14 days) 11.6 and in October (14 days) 14.1.

Blue Tits are the main users of these lamps, but Great Tits (*P. major*), Wrens (*Troglodytes troglodytes*) and House Sparrows (*Passer domesticus*) also occur. The habit is not confined to Salisbury for one of the 14 lamps of similar design examined at Christchurch, Hampshire, during November 1959, was occupied by a Blue Tit. I am grateful to Mr. G. H. Forster for this latter observation and also to the Salisbury City Engineer, Mr. H. Rackham, for details of the lamps.

F. P. ERRINGTON

[Mr. Michael J. Carter has also sent us an account of a Blue Tit (not necessarily only one individual) roosting in a street lamp at Epsom, Surrey, regularly each winter since 1955-56. He particularly comments on the fact that this bird thus roosts in a brightly illuminated and heated chamber in contrast to the usual dark hole. Roosting in street lamps is, however, an old habit of Blue Tits in London and surrounding towns (see *The Birds of the London Area since 1900*, p. 238).—Eds.]

Coal Tit plucking fur from remains of Field Vole.—On 17th April 1961, at Clapgate, near Wimborne, Dorset, I noticed a Coal Tit (*Parus ater*) plucking fur from the remains of what looked like a Field Vole (*Microtus agrestis*). It held the corpse down with both feet, and was only able to extract the hair with considerable effort. Eventually it flew away holding a large wad of fur in its bill. My only previous experience of this nature concerned a Yellow Wagtail

(*Motacilla flava*) which was plucking the white hair from the belly of a dead Hare (*Lepus europaeus*) at Notton, near Chippenham, Wiltshire, on 22nd May 1947 (*Report Nat. Hist. Section Wilts. Arch. & Nat. Hist. Soc.* 1947, p. 234).

[There may be nothing unusual about this behaviour. It is normal for Coal Tits to line their nests with hair or down and one would expect them sometimes to collect the former from dead mammals. Jackdaws (*Corvus monedula*) and Starlings (*Sturnus vulgaris*) regularly pluck moulting hair from the backs of donkeys, sheep and cattle. However, there seem to be few actual published records of small Passerines obtaining their nest material from corpses, though Dr. N. Tinbergen adds that he has seen a Wheatear (*Oenanthe oenanthe*) pulling wool from the body of a dead sheep.—Eds.]

Female Blackbird attacking shrew.—In July 1959, at Itchenor, Sussex, I watched a Blackbird (*Turdus merula*) attacking something which I thought at first was a large bumble-bee. She kept flying to the ground, picking this thing up, flying a short distance, dropping it, and then repeating the procedure over and over again. Eventually, on hearing shrill squeaks coming from this object, I approached the Blackbird (a very tame female which we had helped to feed when, as a very sickly youngster, she was deserted by her parents soon after leaving the nest). The bird dropped the object, which by now was rather dazed by all its falls, and I was able to identify it as a shrew (*Sorex* sp.) before it finally darted off. F. E. LANCHESTER

Fungus disease affecting Robins and other species.—On 21st February 1961, E.A.S. saw an almost completely bald Robin (*Erithacus rubecula*) at the feeding tables in her garden sanctuary at Welwyn, Hertfordshire. On the 23rd we both watched it and E.H. was able to obtain several photographs, two of which are reproduced on plate 49. The bird is shown there with two Blue Tits (*Parus caeruleus*) and it is worth adding that we noted no animosity from other species towards it. On the other hand, even for a Robin, it was unusually aggressive towards its own kind. Though it lacked the majority of the feathers on the upper side of its head and could only partly open its eyes, which was obviously a considerable handicap when picking up food, it seemed strangely vigorous and its ability to fight was unimpaired. During the six days it was in the garden it was apparently very hungry and it gradually became more and more aggressive, continually driving off other Robins (at this time five or six were regularly visiting the tables). On more than one occasion E.A.S. saw it on top of another Robin which it was attacking fiercely on the ground.

On 27th February, the bird was found dead and thereupon sent to

the Central Veterinary Laboratory of the Ministry of Agriculture, Fisheries and Food, at Weybridge, Surrey, where it was found to be a female in very poor condition. The following is an extract from their report, dated 7th March:

"On post-mortem examination the carcase was found to be very decomposed, but there was no evidence of any specific bacterial disease. Although the skin lesions on the head and chin superficially resembled favus of poultry, our mycologist has been unable to isolate the fungus which causes this particular disease. A type of fungus has been isolated, but it is not a species which is known to be pathogenic and so far it has not been identified. Several years ago a Blackbird (*Turdus merula*) was received for examination at this laboratory, which showed similar skin lesions involving the head and also the region of one of the hocks. From that specimen, however, no fungus was isolated and, therefore, the fungus which is present in this case may be purely secondary. No external parasites were found in association with these lesions. Pox causes skin lesions in birds, but they in no way resemble the lesions present on this specimen."

It is disappointing that it was not possible to isolate a known fungus from the Robin, but diseased birds are so rarely seen that it seems worth placing these facts on record. Moreover, this is apparently not an isolated case, in that E.A.S. has recently had a number of other birds with feathers missing from the area of the head. These are still to be seen in the garden at the present time (mid-June). They include another Robin, though this is affected on one side of its head only. A male Blackbird had some feathers missing round its beak in February and has subsequently lost most of those on the rest of its head; its plumage in general is dull and ragged, but otherwise its condition and behaviour seem normal. A Dunnock (*Prunella modularis*) has lost all the feathers from the front of its head, but in other ways appears unaffected. The most serious case, however, involves a Great Tit (*Parus major*) which lost all its head and facial feathers over a period of about two weeks; its skin is blue-grey, but where the feathers have recently been it is pink and looks tender. This bird also seems surprisingly happy and feeds well, and if, as appears likely, it is the same infection which is attacking all these birds, one wonders whether the fungus disease was, in fact, the actual cause of the original Robin's death. On the other hand, a similarly affected Dunnock did die in the garden some years ago (unfortunately no details were kept).

EILEEN A. SOPER and ERIC HOSKING

[We should be very glad to receive any similar observations.—Eds.]

Goldcrest eating bread.—The following observation may be of interest in connection with Sir Julian Huxley's note on a Goldcrest (*Regulus regulus*) eating bread and fat (*Brit. Birds*, 53: 578). On 2nd

January 1961, we were told that a Goldcrest had begun to take food put out on a first-floor window-sill at Ambleside, Westmorland, and that same day we were able to watch one of its visits. The food on the sill included moist bread, fat and cooked potato, but the bird ate only minute pieces of the bread.

J. B. and S. BOTTOMLEY

House Sparrows and other birds drinking nectar from greengage blossoms.—The following observations may be of interest in connection with the recent paper by J. S. Ash, P. Hope Jones and R. Melville on "The contamination of birds with pollen and other substances" (*Brit. Birds*, 54: 93-100).

On 3rd April 1961, I was looking out of the window of my house at Melbourn, Cambridgeshire, when I noticed half-a-dozen House Sparrows (*Passer domesticus*) paying particular attention to the blossom on the greengage trees, which was then at its peak. Through binoculars I saw that they were actually inserting their beaks into the centres of the flowers, sometimes hanging nearly upside down to do so. On examining the blossom, I found that the calyx cups were full of a clear liquid which was extremely sweet and not just rain water. This excess of nectar was presumably due to the damp weather of the previous weekend. For this same reason there were few insects about and I could see none in these particular flowers. The birds were not damaging the blossom in any way and their actions were very gentle. Every now and then one would tilt its head backwards slightly and I could only come to the conclusion that they were actually drinking the nectar.

I walked on through my other orchards (about thirty acres of various kinds of plum trees) and found that there were parties of House Sparrows wherever there were trees in blossom, but none on those which had finished flowering. The birds were more difficult to see in the orchards than in the trees near my house, but I was able to watch several House Sparrows, two Tree Sparrows (*P. montanus*), a male and a female Chaffinch (*Fringilla coelebs*) and a Dunnock (*Prunella modularis*) all apparently drinking nectar. There must have been three or four hundred small birds, mostly House Sparrows, spread over the orchards.

CYRIL H. E. HAGGER

Letters

Black-headed Gulls eating acorns

Sirs,—With reference to K. G. Spencer's letter on Black-headed Gulls (*Larus ridibundus*) eating hawthorn berries and acorns (*Brit. Birds*, 54: 130-131) and Miss Sybil M. Butlin's note in the same issue (54: 118),

I should like to draw attention to an observation of mine which appeared in the *Ornithological Report for Northumberland and Durham for 1954* (p. 116). This described how several Black-headed Gulls were seen circling over oak trees in a wood near Howick, Northumberland, on 24th October 1954. They were alighting on the topmost branches and there collecting food, probably acorns. W. S. CRASTER

Sand Martins nesting in heaps of sawdust

Sirs,—With reference to the note and editorial comment on Sand Martins (*Riparia riparia*) nesting in sawdust (*Brit. Birds*, 54: 205-206), I should like to draw attention to the description of a similar site in C. B. Ticehurst's *A History of the Birds of Suffolk* (p. 185). This was in a large heap of sawdust at a sawmill at Brandon, Suffolk. In 1876 a considerable number of burrows were excavated by the birds, and Sand Martins were still nesting in the same place twenty-five years later.

B. S. NAU

[Dr. N. F. Ticehurst points out that this colony, which was adjoining the railway station at Brandon, was also recorded in Yarrell's *A History of British Birds* (4th ed., vol. 2, p. 358) and in *The Zoologist* (series 2, p. 5108). He adds that he himself saw the colony several times in 1893 and the following three years; there were well over a hundred pairs there then.—Eds.]

Sirs,—Dr. R. A. F. Cox's note on Sand Martins (*Riparia riparia*) in sawdust (*Brit. Birds*, 54: 205-206) prompts me to draw attention to a similar record described by W. Fuchs and E. Rüedi in *Der Ornithologische Beobachter* (56: 30), under the title "Sägemehlhlügel als Nistplatz der Uferschwalbe in Schweden". The same authors also quote P. O. Swanberg and Dr. Bertil Hanström to show that Sand Martins have been found nesting in such sites in several Swedish provinces, even though "only seldom" or "exceptionally". E. SUTTER

Bird Observatories "Flying Squad"

Sirs,—The Nuffield Grant Committee of the British Trust for Ornithology, in conjunction with the Bird Observatories Committee, announce a scheme which they hope will help to alleviate the manning problem at certain of the bird observatories, and at the same time assist those bird-watchers who are keen to devote holiday time to constructive field-work in migration study.

Coverage during the autumn season is required at a number of the observatories, e.g., Cape Clear, Tory Island, Lundy, Isle of May, Great Saltee, etc., and the intention is to form a "Flying Squad" of bird-watchers who are able and willing to step into the breach at one

or other of these stations and keep the observations and ringing going. Members of the "Flying Squad" would be directed to the observatory most in need of manpower at the particular time, and would receive a grant of £5 per person to help towards the expenses of the trip.

Any bird-watcher interested in taking part in this experimental venture, which is designed to get as complete and even a coverage of the autumn migration as possible, should write to me at the British Trust for Ornithology, 2 King Edward Street, Oxford, with a note of (a) the dates between which he (or she) is available, (b) his previous experience of bird observatories, (c) whether he is the holder of a ringing permit, and (d) three or four observatories he would like to visit, in order of preference.

KENNETH WILLIAMSON

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

[These are largely unchecked reports, not authenticated records]

This summary is mainly concerned with the two-month period from mid-April to mid-June and follows on after the one in our April issue (pages 171-172). It deals chiefly with the rarer species, but also covers influxes of certain less unusual birds.

The last few days of April and, more particularly, the beginning and middle of May presented a picture that may now be regarded as more or less annual. Some time in this period every year we expect an influx of **Black Terns** (*Cblidonias niger*) and a scattering of the much rarer **White-winged Black Terns** (*Cb. leucopterus*). Every May, too, we also get several records of other mainly southern and south-eastern species which are generally regarded as rare vagrants to this country. June, on the other hand, is usually a quiet month, but this year it produced a spate of quite surprising records.

BLACK AND OTHER SOUTH EUROPEAN TERNS

In May 1960 the passage of **Black Terns** was unusually large, over four thousand being reported during the peak period, and it lasted for over a week (*Brit. Birds*, 53: 316-317). This year, however, the influx was much smaller and almost all the records were concentrated on one day, 13th May. Although it was a Saturday, this probably represents a genuine peak since the numbers were very small on the Sunday and still smaller on the Friday in areas where regular weekday watching is carried out. The biggest concentration reported was actually a really large one—about 350 at Hanningfield Reservoir (Essex)—and parties of around a hundred were also seen at Queen Mary Reservoir (Middlesex) (80-90), Old Staines Reservoir (Middlesex) (100+) and Pitsford Reservoir (Northamptonshire) (about 110), while gatherings of between thirty and fifty occurred at Abberton Reservoir (Essex), Stewartby brick-pits (Bedfordshire), Eye Brook Reservoir (Leicestershire) and Chew Valley Reservoir (Somerset). All other parties were much smaller, however, and it is significant that every one of these major concentrations took place on 13th May. In most cases the comment was that all had gone by the following day except for one or two odd stragglers. The influx was largely confined to the south-eastern quarter of England and, apart from the Somerset record already mentioned, the only sizeable party elsewhere was one of 22 at Spurn (Yorkshire), again on the 13th.

There was no penetration of north-west England and Wales, such as occurred in 1960. The earliest Black Terns appeared in Sussex and Norfolk on 19th April, in Kent on the 21st, in Northumberland on the 22nd and Dorset on the 24th. Odd stragglers were reported inland up to at least 23rd June.

This year a total of five **White-winged Black Terns** were all in a period of eight days from the time of the Black Tern influx. The first were a single bird at Queen Mary Reservoir (Middlesex) and two at Chelker Reservoir, near Ilkley (Yorkshire), all on the 13th. These were followed by one at Stewartby (Bedfordshire) on the 16th and 17th, and one on the Aberffraw Estuary (Anglesey) on the 21st. A long time afterwards, and quite unconnected, a **Whiskered Tern** (*Ch. hybrida*) appeared at Staines Reservoir (Middlesex) on 24th and 25th June. **Gull-billed Terns** (*Gelochelidon nilotica*) are now of sufficiently regular occurrence in south-east England throughout the summer to be almost outside the scope of this group. However, it is worth mentioning single birds at Herne Bay (Kent) on 8th May, at Selsey Bill (Sussex) on 11th and 28th May, and at Minsmere (Suffolk) on 8th June.

SOUTHERN WATER-BIRDS AND RED-FOOTED FALCONS

The smaller herons are usually included among the annual spring wanderers to Britain and this year was no exception. Indeed, there was something of an influx in the south-west at the very end of April. Three **Purple Herons** (*Ardea purpurea*), two of them probably young birds, appeared on St. Mary's (Isles of Scilly) on 29th April, and the next day an adult and a juvenile **Night Heron** (*Nycticorax nycticorax*) were seen in the same area; all five stayed until 6th May. Meanwhile, the first of three **Little Egrets** (*Egretta garzetta*) seen in Devon this spring made itself at home on Braunton Marshes for several days right at the beginning of May. The other two Little Egrets were in the middle of June, by the River Otter near Budleigh Salterton and on the Axe Estuary on the 13th and 16th respectively (these two Devon localities are only about fifteen miles apart). There was also a further **Night Heron** about this time, near Lyndhurst (Hampshire) on 14th June. Another "regular" is the **Red-footed Falcon** (*Falco vespertinus*) and this year the species was reported from five counties. There was a single male on St. Agnes (Isles of Scilly) on 27th and 30th May; another at Cley (Norfolk) on 30th April and 1st May, and what was presumably a different bird there on the 16th; a male at Ockley (Surrey) on the 13th; a first-summer male at Beachy Head (Sussex) on the 20th; and an adult female at Woodbury (Devon) on the 21st. Single **Black-winged Stilts** (*Himantopus himantopus*) were noted at Sidlesham Ferry (Sussex) on 6th and 16th May, and a pair on Havengore Island (Essex) on 4th June.

The species mentioned so far have, with the exception of the Whiskered Tern, been ones which come every year, but three others should be mentioned before we turn to the Passerines. A **Slender-billed Curlew** (*Numenius tenuirostris*), a bird which at the moment has a very slender claim to inclusion on the British and Irish list, was claimed at Grove Ferry (Kent) on 14th May, and two **Ruddy Shelducks** (*Casarca ferruginea*) flew past Hilbre Island (Cheshire) on the 13th. Ruddy Shelducks are commonly kept in captivity and ones seen at large are usually regarded as escapes, particularly as the species is now getting so scarce in many parts of its European range, but the dates of both these observations are perhaps of some significance when looked at against the general picture which is so concentrated round 13th May. However, it was the first half of April which produced another interesting bird which one assumes must have been an escape. This was a **White Stork** (*Ciconia ciconia*) which was seen at a number of places in north-west England and south-west Scotland in the fortnight following 4th April. Indeed, it made itself so conspicuous that it is possible to map its wanderings almost throughout that period. It first appeared near Southport (Lancashire) on the 4th and in the

RECENT REPORTS AND NEWS

next week was noted at Pilling and Leighton Moss. On the 10th it moved into Westmorland and stayed near Windermere until the 13th at least. On the evening of the 15th, it arrived at Gosforth (Cumberland) and left the following morning for Maryport (Cumberland) where it stayed until the middle of the day. On the 17th, 18th and 19th it was seen at Lochmaben (Dumfries-shire).

SMALLER LAND-BIRDS

Turning now to the smaller land-birds, we find an interesting scattering of southern warblers and shrikes. A **Bonelli's Warbler** (*Phylloscopus bonelli*) was trapped and ringed at Walberswick (Suffolk) on 29th and 30th April; a **Subalpine Warbler** (*Sylvia cantillans*) appeared at Pagham Harbour (Sussex) on 17th May; a **Great Reed Warbler** (*Acrocephalus arundinaceus*) was seen and heard at Burton Mere, near Burton Bradstock (Dorset) on 20th May; and **Icterine Warblers** (*Hippolais icterina*) were recorded at Bardsey (Caernarvonshire) on 23rd and 25th May, and at Fair Isle on the 31st. Earlier there had been a **Savi's Warbler** (*Locustella luscinioides*) at Selsey Bill (Sussex) on 10th, 17th and 18th April. Among shrikes, the number of **Woodchats** (*Lanius senator*) was equalled by the number of the normally much rarer **Lesser Greys** (*L. minor*): the only Woodchats reported were at Spurn (Yorkshire) on 31st May and near Cheltenham (Gloucestershire) on 6th June, apart from one in the Isles of Scilly in late May, while Lesser Grey Shrikes were seen at Holyhead Mountain (Anglesey) on 26th May, and at Allet near Truro (Cornwall) on 9th June. A "southern-type" **Short-toed Lark** (*Calandrella cinerea*) stayed on Fair Isle from 20th to 30th April, and a **Tawny Pipit** (*Anthus campestris*) remained on St. Agnes (Isles of Scilly) from 14th to 18th May.

As the **Serin** (*Serinus canarius*) is one of several species currently spreading on the Continent, it is rather satisfactory that there was a small crop of observations this spring. On 1st and 2nd April what must have been one was seen briefly in flight at Dungeness (Kent) and heard by an observer very familiar with this species. Unfortunately the circumstances were not good enough to make a valid record, but a Serin was well seen at Dungeness nearly two months later, on 29th May. Meanwhile, there had also been single Serins at Spurn (Yorkshire) on 13th April and at Gibraltar Point (Lincolnshire) on 16th May.

There were several reports of **Golden Orioles** (*Oriolus oriolus*), particularly in the Isles of Scilly and East Anglia, and these included single ones as far north as Gainsborough (Lincolnshire) on 21st May and Bardsey Island (Caernarvonshire) from 5th to 9th May. The latter, a female, was caught and ringed. **Hoopoes** (*Upupa epops*), on the other hand, seem to have been rather scarce compared with most other recent springs. Odd ones appeared in several southern counties between late March and the end of the third week of May, but only a handful altogether. The most northerly reports came from near Selkirk on 17th-18th April, Hull (Yorkshire) during 26th-30th April, and Benderloch (Argyll) on 19th May. That third colourful wanderer from the Continent, the **Bee-eater** (*Merops biaster*), was reported only once this spring, from Camberley (Surrey) on 9th April.

WESTERN AND EASTERN VAGRANTS

apart from the vagrants which go to make up the spring picture every year, there were a number of much less expected arrivals. The Whiskered Tern and one or two warblers have already been mentioned. Cornwall had more than her share of the remainder with a **Terek Sandpiper** (*Tringa terek*) at Melancoose Reservoir, near Newquay, on 13th June and a male **Wilson's Phalarope** (*Phalaropus tricolor*) at Parazion Marsh from the 15th to at least the 24th. There are only three British records of the former and only five of the latter, and, since the Terek Sandpiper is an Asiatic bird breeding as far west as Finland while the other is a North American species, one would normally expect such birds to be several thousand miles apart

at that time. The middle of June also provided several other curious stragglers. A **Sabine's Gull** (*Xema sabini*) in the area of Swanage (Dorset) from 13th to 18th June, and an immature **Bonaparte's Gull** (*Larus philadelphia*) at Porto Bello, Brighton (Sussex) on the 20th, taken in conjunction with the Wilson's Phalarope, provide evidence of an arrival from arctic America. On the other hand, the **Sooty Tern** (*Sterna fuscata*) at Hurst (Hampshire) on 17th June must presumably have come north since this species is normally confined to tropical waters.

There were several other reports of American species in the middle fortnight of May: a **Greater Yellowlegs** (*T. melanoleuca*) at Holme (Norfolk) on the 6th, a **Lesser Yellowlegs** (*T. flavipes*) at Foulness (Essex) on the 13th, and a **White-throated Sparrow** (*Zonotrichia albicollis*) at Needs Oar Point (Hampshire) on the 19th. We have also now heard of a **Lesser Yellowlegs** by Swords Estuary (Co. Dublin) on 8th April and a **Pectoral Sandpiper** (*Calidris melanotos*) on Duncrue Street Marsh (Belfast) from the 9th to the 13th.

Turning now to the remaining Scandinavian and eastern species, we find that there was an adult **White-billed Diver** (*Gavia adamsii*) in full plumage at Fair Isle on 14th May (about which time unusual numbers of **Great Northern Divers**, *G. immer*, were reported in the Hebrides and other western areas). A **Tengmalm's Owl** (*Aegolius funereus*) was seen on Stromness (Orkney) on 1st May (the one referred to in our last summary was a belatedly received observation from the 1959-60 winter and mentioned in error). There was a **Red-throated Pipit** (*Anthus cervinus*) on St. Agnes (Isles of Scilly) on 13th and 14th May. **Red-headed Buntings** (*Emberiza bruniceps*) included single males on Fair Isle on 20th-21st April, at Cley (Norfolk) on 2nd-3rd May, at Salthouse (Norfolk) on 13th May and at Breydon (Norfolk) next day, on St. Martin's (Isles of Scilly) on 28th May, on Fair Isle again on 5th-7th June (a very obvious escape) and on Little Cumbrae (Buteshire) on 11th June.

Rarity Records Committee: Hon. Secretary

IT IS WITH MUCH REGRET that we have to announce the resignation of G. A. Pyman as Honorary Secretary of the Rarity Records Committee. New professional commitments which began in April have made it impossible for him to continue with the not inconsiderable task of following up several hundred records each year, arranging for their circulation, and preparing the annual "Report on rare birds in Great Britain". We feel sure that our readers will join with us in paying tribute to his great achievements since the Committee was formed in June 1959. In little more than eighteen months he coped with the work of three years, a total of well over a thousand records, and compiled three twenty-page reports. He has made a solid and, we think, successful structure of what was no more than an untried framework when he took it over. Fortunately, he is not severing his connection with the Committee altogether, but continuing to serve on it as an ordinary member.

We welcome as his successor C. M. Swaine, a Gloucestershire schoolmaster who is editor of the North Gloucestershire Ornithological Report and B.T.O. Regional Representative for that area. We hope that all will support him in his new task. His address is Mill House, Rendcomb, Cirencester, Gloucestershire.

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PUBLICATIONS (post free): *Island of Skomer*, ed. John Buxton and R. M. Lockley, 18s. (few copies left); *The Birds of Carmarthenshire* by G. C. S. Ingram and H. Morrey Salmon, 5s. (in stiff covers 1s. extra) (4s. to members); *A List of Pembrokeshire Plants* by F. L. Rees, 3s.; *The Flora of St. David's Peninsula* by C. L. Walton, 3s.; *Skokholm Bird Observatory Reports* for the years up to 1960, 3s. each; *Nature in Wales*, back numbers, 3s.

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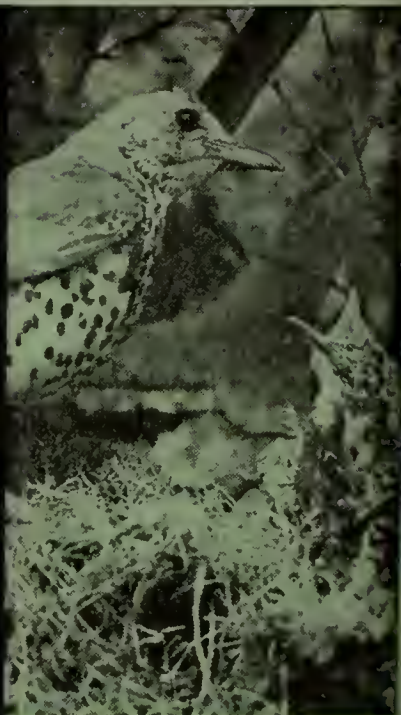
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The editors and publishers regret the present delays in publication, but it is expected that the next issue will appear by 25th September.

British Birds

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AUGUST 1961



Conservation and predation problems

of birds of prey in Sweden

By Kai Curry-Lindahl

Zoological Department, Nordiska Museet and Skansen, Stockholm

INTRODUCTION

TO ALL APPEARANCES, the effect which birds of prey have on their quarry is simple. They kill and devour other animals. Through the centuries man has observed this and has generalised from it. If the animal killed has been considered "useful", the predator has immediately been labelled "noxious". Consequently, man has generally attempted to cut down birds of prey in order to increase his stocks of game. This killing has sometimes been successful, sometimes not. But, as a rule, the trouble taken has been wasted, for there seems to have been little or no positive effect on the "useful" animals.

In Sweden raptorial birds were long considered a nuisance and could be killed throughout the year. As a result they were almost exterminated. Protection then began because it was scientifically interesting to preserve these species, and because it was felt that they belonged by tradition to the country's fauna. Today we have come to the conclusion that birds of prey must be protected not only for their beauty and scientific value but, above all, for biological reasons. Research work on different species of raptors has shown us that they are an important part of a biotic community, and that their influence in reducing the numbers of game species is usually negligible.

The first birds of prey to be protected in Sweden throughout the year were the Kite (*Milvus milvus*), the Marsh Harrier (*Circus aeruginosus*) and the Hen Harrier (*C. cyaneus*). This was as long ago as 1919. Then, in 1924, protection was extended to the Golden Eagle (*Aquila chrysaetos*) and the White-tailed Eagle (*Haliaeetus albicilla*), and later to all eagles, harriers and kites. In Sweden this meant that all species of the genera *Aquila*, *Haliaeetus*, *Circaetus*, *Circus* and *Milvus* appearing in

the country were automatically protected by law throughout the year. During the 1950's the Honey Buzzard (*Pernis apivorus*), the Osprey (*Pandion haliaëtus*) and all species of the genus *Falco* were added to the list and these birds now receive total protection. In addition, all buzzards (*Buteo* sp.) and the Goshawk (*Accipiter gentilis*) are now protected from 1st April to 31st August. Only the Sparrowhawk (*A. nisus*) may still be killed throughout the year.

No other raptor in Sweden has caused so much controversy as the Goshawk. As a result of intensive campaigns by hunters to exterminate it, the species had decreased tremendously and become very rare in southern and central Sweden before a close season from 1st March to 31st August was established. The breeding period was thus covered fairly well, but pressure from the hunters later reduced this close season by a month, so that the species may now be killed in March. This is very unfortunate, because Goshawks in Sweden are particularly vulnerable to human predation then. They are just starting their nesting activities and on early March mornings the breeding pairs loudly announce their presence in the forests. This reveals the positions of their nests, where they can easily be shot.

Conservationists in Sweden are now aiming at full protection for all species of buzzard, renewed protection for the Goshawk in March, and protection of the Sparrowhawk during the breeding season. The last step is not necessary for the Sparrowhawk's own sake because it maintains its numbers fairly well, but it would save other birds of prey from being shot "by mistake".

Legislative measures alone are not sufficient to preserve the biological rôle of birds of prey, however, and it is very important to avoid classifying them into "harmful" and "useful" species. Their ecology and function in biotic communities cannot be thoroughly understood without detailed studies of their necessities, the nutritional value of their different food items, their metabolism, the food consumption of different species in various habitats in all the seasons of the year, their hunting techniques and their choices of prey, as well as predator-prey relationships, population dynamics and cycles, and so on.

At present not very much is known about these topics, though a considerable amount of material has been accumulated in various countries, including Fenno-Scandia. In a separate paper Göran Bergman gives brief summaries of what is known about the food habits of Fenno-Scandian raptors and owls, and in a future issue J. F. Willgohs and Thorvald Lindquist will deal respectively with the White-tailed Eagle and with the problem of Peregrines (*Falco peregrinus*) and homing pigeons (*Columba*). In the present paper I propose to discuss some general questions connected with the food biology of the diurnal birds of prey in Scandinavia and Finland.

FOOD CONSUMPTION

It is essential to discover how much adult raptors eat. We know that they are capable of fasting for fairly long periods if they are in good health, and experience at zoological gardens has shown that their daily food intake is surprisingly modest. Birds of prey may reach a considerable age in captivity and there are, or have been, many very old eagles, buzzards and hawks at Skansen, the Zoological Garden of Stockholm. These have always been fed on very small quantities of food. In one large cage five Buzzards (*B. buteo*), two Goshawks, and one Rough-legged Buzzard (*B. lagopus*) are kept together. The cage is sufficiently extensive and high to allow the birds to fly about, and a number of trees and bushes grow in it. During the week 12th-18th October 1959 we weighed all food items presented to these birds, and afterwards carefully collected and weighed any remnants. The average food intake per bird per day was exactly 170 gm., or about six ounces. By comparison, Uttendörfer (1952) gives a daily average of 150 gm. for adult Buzzards and adds that the average for a young Buzzard during the whole nest period was 75 gm. per day. The Heinroths (1928) mention that a Goshawk nestling about two weeks old consumed 160 gm. of pure meat as a daily average.

Wild birds probably use somewhat more energy and require more protein than birds in captivity. However, except during migrational and reproductional activities, birds of prey are in general very little on the move. Eagles, buzzards and harriers hunt in a way that does not need any great muscular effort. They soar and glide with very little wing and tail movement, sometimes looking for prey, at other times flying around apparently without special purpose. Such habits can hardly necessitate large quantities of food.

Although I am not able to produce statistical data to show the average food intake of a particular individual of any species of bird of prey, I have a strong impression from my field studies in Sweden that at least eagles, buzzards and harriers need much less food than is generally believed. This was confirmed by a year's observations in tropical Africa, where it is easier to follow the daily routine of birds of prey living on savannas. The same may also apply to other groups of raptorial birds, such as hawks and falcons, but it is much more difficult to observe the daily activities of particular individuals of these species.

Mammalian carnivores of various sizes, especially the larger members of the cat family (Felidae), do not need a meal every day. When they have killed they may eat enormously, but afterwards they often fast for several days, during which time they are completely indifferent

to their prey species, even when these appear in their immediate vicinity. As already stated, birds of prey are able to fast for fairly long periods and it is likely that they are governed by similar physiological rules.

INDIVIDUAL SPECIALISATION

Another important aspect of the food biology of raptors is individual specialisation on particular prey species. It is dangerous to assume that long series of food items from a particular nest are necessarily representative of the prey of the species as a whole. In the case of the Goshawk, for instance, neighbouring pairs living in the same habitats may have quite different food habits. I have data from two such nests about a mile apart. At one the male brought mostly Woodpigeons (*Columba palumbus*) and Black-headed Gulls (*Larus ridibundus*), while at the other the most common food was Jays (*Garrulus glandarius*).

This different food specialisation among individuals of the same species is certainly of survival value because the intraspecific competition is thus less pronounced and the ecological range extended. Probably such individual specialisation evolves accidentally during the early part of the bird's life. Successful hunting of a particular species may cause the young bird to turn especially to this prey. According to Thorpe (1959), there is no need to suppose that birds have an innately organised receptive mechanism which determines that they shall respond to one type of food or another. The following quotation from this author was originally used with reference to individuals of different species, but in some cases, e.g. Goshawks, may equally well be applied to individuals of the same species: "... much evidence now goes to show that from amongst foods equally available and nutritious, birds will tend to prefer those foods with which they can most effectively deal in a given time with the kind of bill and foot mechanism with which they are equipped". There are, however, other cases, even among Goshawks, where no specialisation occurs at all. Such individuals bring a variety of different food items, including both mammals and birds, to the nest.

The specialisation of particular individuals does not mean that they do not shift over to other food when their favourite prey species becomes rare or seasonally disappears from the area. In general, one may say that it is the availability of prey that governs the predator's choice. This is shown by the habit of shifting between different prey species according to their frequency, a phenomenon which is known in all Fenno-Scandian flesh-eating raptors and probably also holds good for insect-eating species. This capacity of shifting from one kind of prey to another is important for migratory species, especially for those which spend the winter in the tropics. Holstein (1950) has shown that

nesting Sparrowhawks in Denmark adapt their predation to the varying abundance of different Passerines during the short period of their passage on spring migration through the territory. However, there are also raptorial birds that feed almost exclusively throughout the year on a very few prey species. The Gyr Falcon (*Falco rusticolus*) is an example of this (Hagen 1952b), as can be seen from Bergman's paper which follows.

Most Fenno-Scandian raptors fall between the two extremes of specialised and catholic feeding. Thus most species concentrate on rather fewer categories of prey than are available to them.

PREDATION ON DOMESTIC ANIMALS

In Sweden only a few species of raptorial birds are known to prey on domestic animals and even they cannot be considered to affect such livestock seriously.

Golden Eagles may prey on young sheep, goats and Reindeer (*Rangifer tarandus*), which in Sweden live in a semi-wild state, and dogs and cats also occasionally fall victim to them. Predation on domestic animals by this species seems, however, to be rather rare, though, of course, it regularly takes care of the dead Reindeer that are fairly common in the mountains. This has caused the Lapps to accuse the Golden Eagle of extensive killing of adult Reindeer as well. Apparently Golden Eagles take carrion even when live food is available.

Some Goshawks prey on poultry, and individual Sparrowhawks sometimes also specialise on chickens.

PREY SELECTION AND PREDATOR-PREY RELATIONSHIPS

Another important part of the predation problem concerns the choice of the individual victim. Does a raptor attack a particular bird or does it take its prey at random? There are many records which indicate that hunting predators react to animals with physical defects. Such animals are more vulnerable and apparently induce attack, which very often ends in death for them. This means that raptorial species have a selective effect through their choice of prey.

To determine whether such a selection occurs, it is necessary to see how the attack is made and in some cases also to be able to examine the dead victim. Although we have small chance of carrying out such observations very often, there is so much evidence of selection of injured and abnormal prey that it is unlikely that the choice could always have been made merely by accident.

In Sweden a selective effect by raptorial birds has been recorded as occurring in four species, namely the Sparrowhawk, White-tailed Eagle, Peregrine and Merlin (*F. columbarius*) (Durango 1948, Rudebeck 1950-51). To these may be added unpublished Swedish observations

of my own for the Sparrowhawk, Buzzard, Rough-legged Buzzard and Golden Eagle.

Rudebeck's studies are of especial value, because he was often able to follow the hunting in detail from beginning to end, and could sometimes also examine the prey after it had been killed. No less than 33.3% of the prey obtained in successful hunts by White-tailed Eagles consisted of cases in which he noted injury, abnormality or abnormal behaviour in the victim. For the Sparrowhawk the minimum percentage was 21.7, for the Peregrine 15.8 and the Merlin 14.3.

The records of both Durango and Rudebeck refer to avian prey only. In my own fragmentary observations on the choice of victim by Buzzards and Golden Eagles, mammalian prey is also involved. Twice I have observed a Buzzard taking injured prey. When I was investigating the relationship between Tawny Owls (*Strix aluco*) and small mammals in southern Sweden (Curry-Lindahl 1956, 1959), it sometimes happened that trapped Bank Voles (*Clethrionomys glareolus*) were injured by the traps. On 14th May 1945, at about 2.50 a.m., I found a Bank Vole that had one of its hind legs jammed by a trap. I released it on the spot, in a small clearing of mixed forest; it could move fairly well without using the injured leg, which was broken. To my astonishment this vole did not seek cover. It moved around, apparently in search of food, which it found here and there. I lost sight of it when I entered the hide I had set up for watching the Tawny Owls. I could see, however, that other Bank Voles were moving about in the skulking way so characteristic of this semi-diurnal and diurnal species. At about 4.45 a.m. a Buzzard came to the clearing and alighted on a Norway spruce. Some ten minutes later it flew down to the ground and apparently seized something. At this moment I left the hide. The Buzzard took wing, letting an object fall as it did so. Half a minute later I found its prey—my injured Bank Vole, still showing signs of life though it died within thirty seconds. My second observation of a Buzzard taking defective prey is less significant. On 6th June 1949 I found a trap containing the remains of a Bank Vole in the nest of a Buzzard. The bird had thus caught the vole when it was either dead or injured.

I have only one personal example of prey selection by a Golden Eagle, but it is a very convincing one. On 23rd June 1959 I was working on the southern slopes of the Tuipe mountain, situated between the lakes Satisjaure and Vuolep Kaitumjaure in Swedish Lapland. Scattered herds of Reindeer were migrating to higher levels, following a very abrupt increase in temperature. A Golden Eagle appeared, soaring high above the slopes, and apparently became interested in the Reindeer, for it started to circle above them. The bird concentrated on a particular herd of about two hundred, of which

some sixty were calves of different sizes. Gradually the Golden Eagle descended, still circling over the Reindeer which did not seem to be worried by it. Among the calves I had observed one that from time to time did not use its left foreleg. Suddenly the eagle came down very rapidly (though not actually stooping) until it was within thirty or forty yards of the ground and about three hundred yards from the herd, towards which it then flew with rather slow wing-beats. Just before it reached the Reindeer, they started to run in what looked like a panic, scattering in different directions, and the calves lost contact with their mothers. Without any hesitation the eagle pursued the injured calf, seized it with both feet and pecked it on the head. Almost immediately the calf tumbled down with the eagle on it, kicked out several times and then lay motionless. The whole action took less than thirty seconds. The eagle did not start eating its kill at once, but first just perched on its victim and looked around. Another Golden Eagle appeared, joined the first on the prey and both then soon started to eat.

My observation of a Rough-legged Buzzard took place in the Sarek National Park in Swedish Lapland. I had had a Fieldfare (*Turdus pilaris*) under observation there for several days. It was behaving quite abnormally and had difficulty in balancing when it perched on branches or hopped on the ground. There did not seem to be anything unusual about its flight, however. This particular Fieldfare was grabbed by a Rough-legged Buzzard just as it and several others took wing together from a meadow where they had been feeding.

On four occasions I have witnessed Sparrowhawks seizing Passerine birds that had physical defects. Two involved Blackbirds (*T. merula*), one a House Sparrow (*Passer domesticus*) and one a Tree Sparrow (*P. montanus*). In both the cases when an injured sparrow was the victim, the birds were in flocks.

In tropical Africa I have had many more opportunities of collecting data on the selective effects of hunting by birds of prey, but that would be beyond the scope of this short paper.

Reverting to Sweden, it is relevant to describe how Black Grouse (*Lyrurus tetrix*) used to be and sometimes still are hunted in winter when they feed on birch buds. The hunters used dummy Black Grouse which were placed high in the birches to attract flying flocks of these birds. This method worked rather well, but from time to time it would happen that a Goshawk detected the flock of Black Grouse before the hunters had had time to shoot and it was generally recognized that in such circumstances the Goshawk usually charged the dummy rather than the live birds. Sometimes the hawk had difficulty in freeing itself from the stuffing of the dummy and was shot before it could escape, but the grouse were thus saved!

In his fine work on wildlife conservation, Gabrielson (1947) states that there is not much definite evidence that predators render a useful service to game species in thus destroying sick and weak animals, thereby helping them to maintain the vigour of the stock. I think, however, that one is justified in concluding that raptorial birds do sometimes actually select physically unfit prey. There is still no scientific evidence to suggest that predators do not fulfil a useful rôle. Such observations as those I have described above convince me that the destruction of animals that prey upon game birds may not only fail to promote the welfare of these species but may even be harmful to them. Nevertheless, we need much more research work in this field before the significance of predation, one way or the other, can be objectively estimated.

Predator-prey relationships are only one of the several factors which regulate animal populations (*cf.* Elton 1942; Errington 1946, 1956; Chitty 1957; Frank 1957; Darling 1959). Indeed, they are probably far from being among the most important. Food shortages, and the resultant intraspecific competition, are one of the most significant regulating factors. Rapid crashes in populations seem often to be caused by endocrinological and other internal phenomena.

Fluctuations in the numbers of avian predators are generally closely correlated with similar variations in the populations of their prey species. Clutch-size increases, the breeding range extends and so on. This is especially pronounced in certain owls and the Rough-legged Buzzard—though, except in a few areas, the latter quite unexpectedly failed to respond to the peak population of Lemmings (*Lemmus lemmus*) in Sweden in 1960 and 1961. It would go far beyond the limits of this short paper to discuss this interesting aspect of ecology, but there are many data from northern Fenno-Scandia to show the relationship between population peaks of prey and predators and I would particularly refer the reader to the following works which give examples from this area: Ekman (1907, 1922, 1944), Rosenberg (1945), Swanberg (1946), Larson (1947), Siivonen (1948, 1950), Kalela (1951, 1954), Barth (1952), Hagen (1952a, 1952b, 1953), Hagen and Barth (1952), Holstein (1956), Curry-Lindahl (1958, 1961).

TERRITORIALITY IN BIRDS OF PREY

Most Swedish birds of prey are generally territorial. The pairs of such species as the Golden Eagle, White-tailed Eagle and Goshawk may shift between several different nest-sites from year to year, but these are usually within the same territory. The birds mainly feed, roost and display inside the territory, the size of which varies according to the availability of food, nest-sites and cover. Ospreys are much less territorial than other birds of prey, however. Their nests are some-

times so concentrated as to form colonies. Several breeding pairs may also regularly and simultaneously fish in a restricted area of the same lake without fighting. Different pairs of Hobbies similarly share feeding areas during the breeding season, particularly when there are concentrations of dragonflies or other insects over reed-beds.

SUMMARY

(1) This paper is the first in a series of four concerning birds of prey in Scandinavia and Finland.

(2) In Sweden all species of *Aquila*, *Haliaeetus*, *Circus*, *Milvus*, *Pandion* and *Pernis* (eagles, harriers, kites, Osprey and Honey Buzzard) are protected throughout the year. All buzzards (*Buteo* sp.) are protected from 1st March to 31st August, and the Goshawk (*Accipiter gentilis*) from 1st April to 31st August, though the Sparrowhawk (*A. nisus*) may be killed throughout the year. However, legislative measures alone are not sufficient to preserve birds of prey effectively.

(3) The daily food intake of birds of prey is low. The average food consumption per day per bird for five Buzzards (*Buteo buteo*), two Goshawks and one Rough-legged Buzzard (*B. lagopus*) kept together in captivity was exactly 170 gm. In the wild state, at least eagles, buzzards and harriers need much less food than is generally believed.

(4) Individual and specific food specialisations are discussed. Two Goshawks nesting a mile apart from each other preyed on different kinds of birds. One specialised on Woodpigeons (*Columba palumbus*) and Black-headed Gulls (*Larus ridibundus*), the other on Jays (*Garrulus glandarius*). It is suggested that individual specialisation evolves accidentally during the early part of the bird's life.

(5) Food specialisation does not prevent predators from changing over to other foods if the favourite prey becomes rare. In general, it is the availability of prey that governs the predator's choice.

(6) The selective effect of raptorial birds is discussed, and some new data of selective predation by Buzzard, Golden Eagle (*Aquila chrysaetos*), Rough-legged Buzzard and Sparrowhawk are presented.

(7) Predator-prey relationships and fluctuations in number of avian predators and prey species are commented upon.

(8) Most Swedish birds of prey are territorial. Nests of Ospreys (*Pandion haliaetus*) are sometimes so concentrated as to form colonies. Several pairs of these birds may simultaneously fish in a restricted area of a lake without showing any aggressiveness towards each other.

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The food of birds of prey and owls in Fenno-Scandia

By *Göran Bergman*

Zoological Museum of the University, Helsinki

THIS PAPER is a brief summary of the information that is available in the Scandinavian and Finnish ornithological literature on the food of the diurnal birds of prey and the owls. The diet of some species has been relatively well investigated, but that of others is little known and the picture is obscured by many not very objective discussions as to whether raptors are destructive to game.

Food summaries of this kind can be misleading for any of several reasons and these should be borne in mind. The tendency of individuals of some species to specialise on a few kinds of prey means that the food remains at just one or two nests may not be representative of the species as a whole. At the same time the climate, ecology and fauna vary considerably in different parts of Fenno-Scandia and this affects the availability of food. Cultivated areas and forests predominate in the south, while there are large regions of bare mountains in the west and north. In Finland and the northern half of Sweden there are vast tracts of coniferous forest and more than 150,000 lakes. To all this must be added the special conditions found in the archipelagos along the coasts of southern Finland, eastern Sweden and Norway. Finally, it must be remembered that many records of the food of raptors are based on food remains without any allowance for the fact that some prey species leave much more recognisable remains than others.

The food percentages given in this paper (mostly rounded to the nearest whole number and so not necessarily totalling exactly 100) are throughout by number and not by weight.

Golden Eagle (*Aquila chrysaëtos*)

Recent studies by Sulkava (1959b) in Finland and the Norwegian records published by Hagen (1952) give a picture of the diet of the Golden Eagle in Fenno-Scandia, though the question of the amount of carrion taken by this species has not yet been fully cleared up. There is evidence that in Lapland especially the Golden Eagle lives to a considerable extent on dead Reindeer (*Rangifer tarandus*) in winter, and on dead Reindeer calves in spring. Since wild Reindeer have been exterminated in Finland, Sweden and most of Norway, and since the

Wolf (*Canis lupus*) and the Wolverine (*Gulo gulo*) have been almost wiped out, the chances of finding dead animals is practically restricted to the area of Reindeer breeding. This may be the main reason why the Golden Eagle population seems now to maintain itself only in the far north and in the mountains.

Sulkava collected 99 fresh remains at 12 nests in Finland in 1958, all in the coniferous forest. The following are the percentages:

Capercaillie (<i>Tetrao urogallus</i>)	33%
Blue Hare (<i>Lepus timidus</i>)	23
Grouse (<i>Lyrurus</i> , <i>Lagopus</i>)	22
Crane (<i>Megalongis grus</i>)	3
Other birds	9
Other mammals	9

The smallest birds were thrushes (*Turdus*) and Cuckoos (*Cuculus canorus*), and the smallest mammals Red Squirrels (*Sciurus vulgaris*) and vole rats (*Arvicola*). The majority of the Capercaillie and Black Grouse (*Lyrurus tetrix*) were adult females. Even grey geese (*Anser*) and Whooper Swans (*Cygnus cygnus*) are on the food list in Finland.

Hagen's Norwegian analysis was based on food remains, pellets and intestinal contents. The percentages on the 137 prey items he lists are:

Blue Hare (<i>Lepus timidus</i>)	28%
Grouse (<i>Lagopus</i>)	26
Capercaillie (<i>Tetrao urogallus</i>), Black Grouse (<i>Lyrurus tetrix</i>)	12
Arctic Fox (<i>Alopex lagopus</i>)	4
Lamb/Kid (<i>Ovis/Capra</i>)	4
Fox (<i>Vulpes vulpes</i>)	3
Young Reindeer (<i>Rangifer tarandus</i>)	1
Carriion of these four mammals	9
Unidentified carriion	2
Other mammals	4
Other birds	4

The prey included two small rodents (*Arvicola*, *Lemmus*), a Cat (*Felis catus*) and a Lump-sucker (*Cyclopterus lumpus*).

Buzzard (*Buteo buteo*)

The diet of the subspecies *rulpinus*, a bird typical of coniferous forests, was investigated by Suomus (1952) in a small locality in Finland. In the four summers from 1949 to 1952 the total number of food animals he actually saw brought to the nest was 358, including the following:

Small mammals	54.0%
Frogs	20.6
Birds	13.5
Lizards, blindworms, snakes, etc.	5.5
Hare (<i>Lepus</i>), Squirrel (<i>Sciurus</i>)	0.5
Not identified	5.8

These percentages are misleading on their own, however, partly because they do not show the changing proportions from year to year which reflected fluctuations in the populations of the food animals, and partly because the remains in the nest were rather different from the prey he saw brought to it. The annual variation in the vole population during the four years could be indicated by the ratios 20:6:3:4, and the corresponding percentages of voles in the diet were 69, 37, 13, and 30. Of the food remains in the nests, 27% were grouse, though these birds formed only 5% of the food which he actually saw brought to the nest. Similarly, 9% of the food remains consisted of Jays (*Garrulus glandarius*), though he never saw a single Jay being carried. All the birds brought to the nests were young.

Rough-legged Buzzard (*Buteo lagopus*)

At least in the breeding area, this species feeds very largely on small rodents. Investigations in Sweden have shown that these animals form over 90% of the diet there, and in Norway about 85%. Hagen (1952) listed 2,114 items of vertebrate prey and these may be summarised:

Small rodents	85%
Other mammals	3
Grouse (<i>Lagopus</i>)	5
Small Passerines	2
Black Grouse (<i>Lyrurus tetrix</i>),	
Capercaillie (<i>Tetrao urogallus</i>)	1
Other and unidentified birds	3

The vertebrate prey included a few frogs and fish and there were also numbers of insects. The mammals were mainly Stoats (*Mustela erminea*), young hares (*Lepus*) and shrews (*Sorex*). The birds, which totalled about 11%, even included some waders, ducks, birds of prey and owls.

Sparrowhawk (*Accipiter nisus*)

The Sparrowhawk typically catches small Passerines up to the size of thrushes, but it also takes a few other birds as large as Magpie (*Pica pica*), Cuckoo (*Cuculus canorus*) and Woodcock (*Scolopax rusticola*). There are also a very few reports of its preying on young game-birds. Hagen (1952) listed 506 prey items which may be summarised as follows:

Small Passerines	79%
Unidentified small birds	12
Other birds	5
Small mammals	5

The following birds showed the highest numbers: Fieldfare (*Turdus pilaris*) 68 and other thrushes (*Turdus* sp.) 111, pipits (*Anthus*) 40,

Brambling/Chaffinch (*Fringilla montifringilla/coelebs*) 25, Reed Bunting (*Emberiza schoeniclus*) 19, Willow Warbler (*Phylloscopus trochilus*) 18, Redstart (*Phoenicurus phoenicurus*) 18 and Wheatear (*Oenanthe oenanthe*) 18. Only three young Capercaillie (*Tetrao urogallus*) or Black Grouse (*Lyrurus tetrix*) were found, and only one young *Lagopus*.

The damage done by Sparrowhawks to game is of little significance in Norway and most of Finland, but wintering individuals in the southernmost part of Finland, in southern Sweden and in Denmark may prey on game birds, especially Partridges (*Perdix perdix*), to some extent. However, this seems to be done only by a small proportion of females with specialised tastes. Incidentally, the statement by Nordberg (1935) that Sparrowhawks on migration catch more birds with some red on their plumage does not seem to me to be satisfactorily proved.

Goshawk (*Accipiter gentilis*)

Sulkava (1956) made a careful study of the diet of ten pairs of Goshawks in the breeding season in Finland, based partly on direct observations at the nest. The results seem to be representative of the food of this species in the coniferous forests of Fenno-Scandia. Other notable investigations were published by Holstein (1942) in Denmark and Hagen (1952) in Norway. It is evident that in different localities the Goshawk preys on widely different species, the main ones in some areas being "valuable". Capercaillie (*Tetrao urogallus*), Black Grouse (*Lyrurus tetrix*) and even Red Squirrels (*Sciurus vulgaris*) are much taken in the forests, Willow Grouse (*Lagopus lagopus*) and Ptarmigan (*L. mutus*) in moorland and mountains, and hares (*Lepus*) in all parts of Fenno-Scandia.

Sulkava's Finnish figures, based on 253 food items in the breeding season, were:

	1949-54 average	1955
Grouse (Tetraonidae)	74%	36%
Crows (Corvidae)	7	4
Red Squirrel (<i>Sciurus vulgaris</i>)	6	46
Ducks (Anatidae)	3	—
Partridge (<i>Perdix perdix</i>)	3	—
Other mammals	5	3
Other birds	2	11

The different proportions of grouse and squirrels in the two periods reflect changes in their availability.

Hagen's Norwegian data, based on 101 mammal and 306 bird items over the whole year, were:

Passerines (except crows)	19%
Hill grouse (<i>Lagopus</i>)	15
Forest grouse (<i>Tetrao</i> , <i>Lyrurus</i>)	12
Pheasant (<i>Phasianus colchicus</i>)	9
Crows (<i>Corvus</i> , <i>Pica</i> , <i>Garrulus</i>)	5
Waders (Charadriidae, Scolopacidae)	4
Chickens (<i>Gallus</i>)	3
Other birds	8
Small mammals	10
Red Squirrel (<i>Sciurus vulgaris</i>)	9
Hares (<i>Lepus</i>)	6

A considerable proportion of thrushes and grouse were young unable to fly and the former were probably taken from nests. The other birds included Pintail (*Anas acuta*), Kestrel (*Falco tinnunculus*), Tawny Owl (*Strix aluco*) and Tengmalm's Owl (*Aegolius funereus*).

Kite (*Milvus milvus*)

Hörstadius (1928) reported the following food remains in a Swedish nest: Green Woodpecker (*Picus viridis*) one, Cuckoo (*Cuculus canorus*) one, Magpie (*Pica pica*) one, Capercaillie (*Tetrao urogallus*) one, pigeons (*Columba*) two, and fish and small rodents. This species eats considerable amounts of insects, worms, dead fish and varying kinds of refuse. It also even takes prey from other raptorial birds.

Black Kite (*Milvus migrans*)

Lundberg (1955) found the following food remains in a Swedish nest: Mallard (*Anas platyrhynchos*) one, Tufted Duck (*Aythya fuligula*) one, Curlew (*Numenius arquata*) two, thrushes (*Turdus*) several, ?Black-throated Diver (*Gavia arctica*) one pull., and Red Squirrel (*Sciurus vulgaris*) one. V. Törnroos (*in litt.*) identified the remains of a hare (*Lepus*) in a nest in Finland, where this species also eats refuse and dead fish.

White-tailed Eagle (*Haliaeetus albicilla*)*

In Norway the White-tailed Eagle seems to prey chiefly on birds, but in the Baltic area, where there are shallow coasts and archipelagos, it turns to a great extent to fish, especially Pike (*Esox lucius*) and carp (Cyprinidae). No real investigations into the diet have yet been published, but many short notes are to be found in the ornithological literature. In Norway this eagle catches both adult and young sea-birds—Cormorants and Shags (*Phalacrocorax carbo* and *aristotelis*), Little Auks (*Plautus alle*), Razorbills (*Alca torda*), Guillemots (*Uria aalge*), Eiders (*Somateria mollissima*), Long-tailed Ducks (*Clangula*

*The forthcoming paper by J. F. Willgohs (see page 298) will deal with the food of the White-tailed Eagle in greater detail.—EDS.

hyemalis) and others (Hagen 1952)—and in some regions even hares (*Lepus*). In the Baltic archipelagos the bird prey includes Eiders, Velvet Scoters (*Melanitta fusca*), Red-breasted Mergansers (*Mergus serrator*), Goosanders (*M. merganser*) and other ducks, and even young of the larger gulls (*Larus*) in the colonies (Nordberg 1950).

In Finland, in the breeding season, it eats fish (both living and dead) approximately as often as birds (adults and young), but it hardly ever takes living mammals. Contrary to what has been claimed, there is no reliable proof of its preying on sheep (*Ovis*) in Finland, but it will eat dead sheep and seals (Phocidae) if it comes across these on islands or on the ice. During the winter the White-tailed Eagle parasitises the Herring (*Clupea harengus*) fisheries on the ice in south-west Finland. At ice-holes it also preys on concentrations of Long-tailed Ducks, Goldeneye (*Bucephala clangula*) and other diving ducks (*Mergus*, *Aythya*). In southern Scandinavia various ducks and other waterfowl, fish, carrion and hares are among its food in winter.

Honey Buzzard (*Pernis apivorus*)

As in other countries, the Honey Buzzard feeds mainly on bees, wasps and bumble bees, and on their nests and larvae. Holstein (1944) carried out careful observations at a nest in Denmark, and the food brought to the young over a period of 53 days was made up of the following: nests of wasps (Vespidae) 64 times, frogs (Ranidae) 20, indeterminable invertebrates 53, nests of bumble bees (*Bombus* sp.) 15, small birds two, worms two, lizards one.

Marsh Harrier (*Circus aeruginosus*)

There have been no real investigations of the food of this species in Fenno-Scandia. Small rodents, the young of several kinds of water-birds—for example, Black-headed Gulls (*Larus ridibundus*), Coots (*Fulica atra*) and ducks (*Anas*)—and also frogs (Ranidae), seem to form the main prey (Hortling 1929-31, Hildén and Linkola 1955).

Hen Harrier (*Circus cyaneus*)

The Norwegian prey items listed by Hagen (1952) included 333 (59%) mammals of seven species and 228 (40%) birds of about 30 species:

Small rodents	57%
Shrews (<i>Sorex</i>)	1
Young hares (<i>Lepus</i>)	1
Small Passerines	21
Young grouse (<i>Lagopus</i>)	7
Waders (Charadriidae, Scolopacidae)	4
Other and unidentified birds	8

The birds included a young harrier. Some insects and two lizards were also found.

Osprey (*Pandion haliaëtus*)

This species feeds almost exclusively on fish, especially Pike (*Esox lucius*) and carp (Cyprinidae). Many nests have been investigated in Finland and Sweden, and in all but one of them only remains of fish have been found. The exception was a nest I discovered with three downy young Velvet Scoters (*Melanitta fusca*) which the young Ospreys had refused to eat. Preying upon mating frogs in the early spring while the lakes are still covered with ice has been reported from Finland (Hildén and Linkola 1955).

Hobby (*Falco subbuteo*)

Curry-Lindahl (1945) watched a nest with young near Stockholm, Sweden, for a total of 30½ hours. During this time insects were brought by the adults on 95 occasions and birds on eight occasions; there were also four other visits when the food could not be determined. The most regularly observed feeding areas of this species are wide marshlands where dragonflies (Odonata) are caught.

Peregrine (*Falco peregrinus*)

Investigations into the food of the Peregrine have been made by Hagen (1952) in Norway and, quite recently, by Sulkava (1959a) in Finland. There is considerable variation in the results, partly as a result of regional differences in the open country avifauna, and partly because this species tends to prey on the commonest birds in its hunting area. There are many other scattered records of food remains found in Peregrine eyries and it is clear that, in spite of its tendency to take the commonest species, this falcon preys on very many kinds of birds and is not in any way dependent on any particular one.

Hagen's data from the mountains of Dovre and certain other fjelds were based on 124 bird items of at least 32 species and he also found a single juvenile Blue Hare (*Lepus timidus*). Sulkava's records were from various parts of Finland and included 483 bird items of about the same number of species as Hagen found. The percentages from both investigations are set out below, with the Finnish material divided into two columns, the first (Finland A) based on 159 fresh remains and the second (Finland B) on 324 remains from earlier years. The latter may have been biased in favour of bigger species because of the difficulty of finding and identifying the remains of small birds. It will be noticed that Hooded Crows, Starlings, thrushes and small waders are high on both Norwegian and Finnish lists:

BRITISH BIRDS

	NORWAY	FINLAND A	FINLAND B
Surface-feeding ducks (<i>Anas</i>)	10%	9%	27%
Grouse (<i>Lagopus</i>)	10	—	—
Black Grouse (<i>Lyrurus tetrix</i>)	2	—	4
Lapwing (<i>Vanellus vanellus</i>)	2	13	12
Curlew (<i>Numenius arquata</i>)	1	—	8
Small waders (Charadriidae, Scolopacidae)	11	15	9
Gulls, terns (Laridae)	2	20	9
Pigeons (<i>Columba</i>)	3	—	14
Cuckoo (<i>Cuculus canorus</i>)	5	—	—
Short-eared Owl (<i>Asio flammeus</i>), Tengmalm's Owl (<i>Aegolius funereus</i>)	5	—	—
Woodpeckers (<i>Dendrocopos</i>)	—	4	—
Hooded Crow (<i>Corvus corone cornix</i>)	23	9	12
Magpie (<i>Pica pica</i>)	5	—	—
Thrushes (<i>Turdus</i>), Starling (<i>Sturnus vulgaris</i>)	12	30	6
Small Passerines	5	—	—

The Norwegian list also includes 6% other birds, from Swift (*Apus apus*) to Storm Petrel (*Hydrobates pelagicus*). According to Hagen, Peregrines have been seen preying on young Slavonian Grebes (*Podiceps auritus*) and Velvet Scoters (*Melanitta fusca*), and even adult Cranes (*Megalongis grus*) and grey geese (*Anser*) have been reported in their diet.

Sulkava also summarised the available records of other Finnish ornithologists and, on these and his own observations, concluded that small Passerines, waders and gulls and terns together make up over three-quarters of the prey of the Peregrine in Finland. His broad figures were: Passerines up to the size of thrushes 30.8%, waders 28.4% and gulls and terns 18.3%. The last figure may well be on the small side, for in the coastal regions gulls and terns seem to be the main food in the breeding season. In the archipelago of southern Finland I have seen Peregrines make their kills on 32 occasions and every time the victim has been one of these birds. The species involved have been Common Tern (*Sterna hirundo*) (18 times), Arctic Tern (*S. macrura*) (5), Lesser Black-backed Gull (*Larus fuscus*) (5), Common Gull (*L. canus*) (3) and Caspian Tern (*Hydroprogne caspia*) (1).

Gyr Falcon (*Falco rusticolus*)

Hagen (1952) summarised the prey found as remains or in pellets during three breeding seasons in the Dovre mountains. From his analysis it is evident that in Scandinavia the Gyr Falcon preys to a very considerable extent on Ptarmigan (*Lagopus mutus*) and Willow Grouse (*L. lagopus*), and this agrees well with earlier investigations in other parts of the Scandinavian mountains. In Hagen's material no less than 205 of 214 prey items, or about 96%, were of one of these two

species. Other birds occurred only seldom, but a few mammals and some beetles were also recognised in the food remains. The mammals included young Blue Hare (*Lepus timidus*), Lemming (*Lemmus lemmus*) and the vole *Microtus*. The fact that it specialises to such an enormous extent upon Ptarmigan and Willow Grouse enables the Gyr Falcon to stay in the Scandinavian mountains throughout the winter, something which no other raptor can do.

Curiously, in spite of the fact that grouse are its main food, the Gyr Falcon's population is higher in or shortly after the years in which the small rodents reach their peak numbers (see Hagen).

Merlin (*Falco columbarius*)

The Merlin preys on small birds of all kinds up to the size of thrushes (*Turdus*) and even Woodcock (*Scolopax rusticola*) and young grouse (*Lagopus*, *Lyrurus*) and Capercaillie (*Tetrao urogallus*). According to Hagen (1952) whose analysis for this species in Norway was based on 713 food items, young game-birds form 4.5% of the diet, other birds about 90%, small rodents about 5% and insects the remainder. The birds occurring most frequently in Hagen's material were pipits (*Anthus*) (which formed 27% of all vertebrates), other small birds of open country and also thrushes. Rodents were found only at times when these mammals were particularly abundant.

In Finland a wintering female Merlin preyed on a flock of twelve Partridges (*Perdix perdix*) until all had been killed, but this was quite extraordinary.

Kestrel (*Falco tinnunculus*)

The Kestrel is very much a specialist predator on small mammals. A few small birds are also taken, but these very seldom include any game birds. Hagen (1952) collected data on 254 food items in Norway and these may be summarised as follows:

Small mammals	90%
Lizards, snakes	6
Small Passerines (to size of <i>Turdus</i>)	4

Also included were a young Black Grouse (*Lyrurus tetrix*) and a single frog.

Eagle Owl (*Bubo bubo*)

The food of the Eagle Owl has been fairly thoroughly studied. Curry-Lindahl (1950a) reviewed his own and other Swedish investigations, and Hagen (1952) summarised the Norwegian material. In addition, some interesting local studies were carried out in Finland by Olsson

(1933) and März (1936). The Swedish and Norwegian results may be summarised as follows:

SWEDEN	%	NORWAY	%
Brown Rat (<i>Rattus norvegicus</i>)	18	Brown Rat (<i>Rattus norvegicus</i>)	3
Other small rodents	18	Other small rodents	40
Hares (<i>Lepus</i>)	4	Hares (<i>Lepus</i>)	7
Red Squirrel (<i>Sciurus vulgaris</i>)	7	Red Squirrel (<i>Sciurus vulgaris</i>)	3
Hedgehog (<i>Erinaceus europaeus</i>)	8	Hedgehog (<i>Erinaceus europaeus</i>)	1
		Other mammals	2
[266 mammals = 55% of all food items; even Cat (<i>Felis catus</i>) and Stoat/Weasel (<i>Mustela</i>)]		[432 mammals = 55% of all food items; even Fox (<i>Vulpes vulpes</i>) and Stoat/Weasel (<i>Mustela</i>)]	
Hooded Crow (<i>Corvus corone cornix</i>)	9	Crows (<i>Corvus</i>)	1
Smaller Passerines	1	Smaller Passerines	3
Birds of prey (<i>Buteo</i> 4 specimens, <i>Accipiter gentilis</i> 3, <i>Accipiter</i> sp. 1, <i>Pandion haliaëtus</i> 1)	2	Birds of prey (<i>Falco tinnunculus</i> , <i>F. columbarius</i> , <i>Buteo lagopus</i> , <i>Accipiter nisus</i>)	1
Owls (<i>Asio otus</i> 3, <i>Aegolius funereus</i> 1)	1	Owls (<i>Asio flammeus</i> , <i>A. otus</i> , <i>Nyctea scandiaca</i> , <i>Surnia ulula</i>)	1
Ducks (<i>Anas</i>)	5	Ducks (<i>Anas</i>)	3
Waders (Charadriidae, Scolopacidae)	1	Waders (Charadriidae, Scolopacidae)	3
Hill grouse (<i>Lagopus</i>)	1	Hill grouse (<i>Lagopus</i>)	7
Other game birds (<i>Tetrao</i> , <i>Lyrurus</i> , <i>Tetrastes</i> , <i>Perdix</i>)	7	Other game birds (<i>Tetrao</i> , <i>Lyrurus</i>)	2
Other birds	6	Other birds	2
[159 birds = 33% of all food items; about 30 species]		[184 birds = 24% of all food items; about 30 species]	
Frogs or toads	1	Frogs or toads	20
Fishes	11	Fishes	1

From the above data and the Finnish material, it is clear that there is considerable variation in the food of this species. In general, most Eagle Owls appear to feed largely on rodents, especially on Brown Rats and Vole Rats (*Arvicola terrestris*), and in some areas also on squirrels and hares. According to Curry-Lindahl, Eagle Owls are regularly seen hunting Brown Rats around human settlements which may be several miles from the nearest nest. However, some take many more birds, particularly Hooded Crows. A pair studied by Olsoni in south-west Finland depended largely on Jackdaws (*Corvus monedula*) which were breeding in a church not far away from their nest. In the Finnish archipelago various gulls, waders and other shore birds are frequent among the food remains of Eagle Owls.



PLATE 51. Broad-billed Sandpiper (*Limicola falcinellus*) at nest, Swedish Lapland, July 1936. The size of a small Dunlin, its proportionately shorter legs and long heavy-based bill, with a downward kink near the tip, give it a squat and ungainly appearance. The breeding adult has a strikingly striped head and its back is black with rich buff longitudinal stripes (pages 320-323) (photo: P. O. Svanberg)



PLATE 52A. Habitat of Broad-billed Sandpipers (*Limicola falcinellus*), Finland, June 1960 (especially the light strip that runs behind the tree). Most nests are in tufts in quaking bogs of mud and short grass (page 323) (photo: C. W. G. Paulson-Ellis)

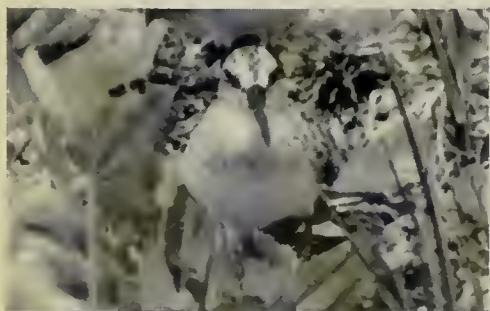


PLATE 52B and 52C. Winter plumage, New Zealand, 1960. Adults are grey and white at this season, but note that the double superciliary is normally still marked (page 322) (photos: D. A. Urquhart)

PLATE 52D. Typical leaf-lined nest with four eggs, Swedish Lapland, June 1942. Only in Fenno-Scandia has this bird been proved to nest, but it doubtless does so in U.S.S.R. (page 321) (photo: P. O. Swanberg)





PLATE 53. Broad-billed Sandpipers (*Limicola falcinellus*), Swedish Lapland, July 1936. This nest was some 2,200 feet above sea-level, in the willow zone beyond the tree limit. Note the markings of head, breast and back and, in the slanting view below, the shape of the long, heavy, broad-based bill (photos: P. O. Swanberg)





PLATE 54. Broad
billed Sandpiper
(*Limicola falcinellus*)
at nest, Finland
June 1960. Note the
richly striped back
pattern, formed by
buff edges to black
feathers. These
photos also show the
variation in the head
markings (page 322
(photos: G. des Forges)

Snowy Owl (*Nyctea scandiaca*)

Hagen (1952) reviewed the diet of the Snowy Owl in the Norwegian fjelds on an analysis of food remains, pellets and stomachs of shot birds:

Small rodents	97.5%
Shrews (<i>Sorex</i>)	0.3
Stoat/Weasel (<i>Mustela</i>)	0.3
Young Blue Hare (<i>Lepus timidus</i>)	0.1
Unidentified small mammals	0.1
Grouse (<i>Lagopus</i>)	1.2
Other birds	0.4
Fish	0.1

The total number of mammal items found was 1,428, of about nine species. Small mammals thus formed 98.3% of the prey identified. Only one Blue Hare and one fish are included in the above percentages.

The Snowy Owl is one of the best examples of a bird whose numbers fluctuate very markedly in accordance with the density of small rodents, and its dependence upon rodents is clear from food analysis.

Hawk Owl (*Surnia ulula*)

The investigations made by Hagen (1952) show that, at least in the breeding season and for as long afterwards as these mammals are abundant, the Hawk Owl preys on practically nothing but small rodents. These include Lemmings (*Lemmus lemmus*) and various voles (*Microtus*, *Clethrionomys*). Of other animals, only a young owl (*Surnia ulula*?), four small Passerine birds and one Stoat or Weasel (*Mustela*) were found in the total of 524 items studied.

Pygmy Owl (*Glaucidium passerinum*)

Hagen (1952) analysed 418 food items from Norway. These were made up of 287 mammals (68.6%) and 131 small Passerine birds (31.4%). About 44% of the mammals were shrews (*Sorex*), while the three commonest birds were Goldcrest (*Regulus regulus*), Great Tit (*Parus major*) and Yellowhammer (*Emberiza citrinella*) which appeared 22, 17 and 14 times respectively in the remains examined.

Hildén and Linkola (1955) examined the contents of two food storage holes of the Pygmy Owl in Finland. The first held the remains of 45 shrews (*Sorex*), 13 Bank Voles (*Clethrionomys rufocannus*), two Field Voles (*Microtus agrestis*), two Goldcrests and one Willow Tit (*Parus atricapillus*). The second contained 34 small mammals and three small birds, so that the two combined included 94 small mammals and six small birds. This is a very small owl with a clear preference for very small prey!

Tawny Owl (*Strix aluco*)

Observations from Norway (Hagen 1952), from Sweden (Curry-Lindahl 1950b) and from Finland, the last partly my own, clearly show that small mammals, especially rodents, form 70-80% of the food of the Tawny Owl, and that this proportion remains constant throughout the year. Shrews (*Sorex*) make up 11-14% of the diet, birds generally 3-10% and frogs about 2%. The largest animals in the Norwegian list of 803 mammal and 84 bird items were Brown Rat (*Rattus norvegicus*), Vole Rat (*Arvicola terrestris*) and Red Squirrel (*Sciurus vulgaris*); and Magpie (*Pica pica*), Jay (*Garrulus glandarius*), Tengmalm's Owl (*Aegolius funereus*), Woodcock (*Scolopax rusticola*), Cuckoo (*Cuculus canorus*) and Feral Pigeon (*Columba livia*). Feral Pigeons were recorded more than any other bird, indicating that Tawny Owls collect a lot of their food in towns and villages.

In years when the numbers of small rodents are low, young Common Terns (*Sterna hirundo*) and Black-headed Gulls (*Larus ridibundus*) partly replace mammals in this owl's diet in the coastal regions and at some inland gulleries in southern Finland, also in Sweden (Curry-Lindahl *in litt.*). In such years I have even found shells of snails (*Lymnaea* sp.) and Cockles (*Cardium edule*) in the pellets of owls breeding in the archipelago. In general, however, when populations of small rodents are low, Tawny Owls shift first to shrews, as has been shown by Curry-Lindahl.

Great Grey Owl (*Strix nebulosa*)

Collett (1921) stated briefly that in the winter months only small mammals are found in the food remains of the Great Grey Owl in Norway. He specifically mentioned wood mice (*Apodemus*), field voles (*Microtus*) and bank voles (*Clethrionomys*), also some shrews (*Sorex*). There have been no modern investigations into the food of this species, but observations made by Lundberg (1955) at a nest with young agree well with Collett's conclusion.

Ural Owl (*Strix uralensis*)

The food of the Ural Owl has been studied only in Norway. Of 87 food items summarised by Hagen (1952), 76 were small mammals, mostly Bank Voles (*Clethrionomys rufocanus*). The remainder were two Black Grouse (*Lyrurus tetrix*), two Hazel Hens (*Tetrastes bonasia*), two thrushes (*Turdus*), one Weasel (*Mustela nivalis*), one indeterminable rodent and two indeterminable birds.

Long-eared Owl (*Asio otus*)

According to Hagen (1952), the Long-eared Owl takes up to 95% small rodents (the species varying in different areas) and a few small

birds, of which thrushes (*Turdus*) and Tengmalm's Owl (*Aegolius funereus*) were the largest recorded. Hagen's material consisted of 733 prey items, all from the breeding season as this species is only a summer visitor in Norway.

Short-eared Owl (*Asio flammeus*)

The Short-eared Owl is also only a summer visitor in Fenno-Scandia, and Hagen (1952) showed that in the breeding season in the Norwegian fjelds it too feeds almost entirely on small rodents. These formed about 95% of the 508 food items he analysed. In addition, there were 2% Passerines, but no game birds at all.

Tengmalm's Owl (*Aegolius funereus*)

The food remains listed by Hagen (1952) included 149 small rodents and 15 shrews (*Sorex*), and clearly showed that Tengmalm's Owl feeds almost exclusively on small mammals, though some small birds and even insects are occasionally taken. If there is a shortage of small mammals, however, this owl turns to catching small Passerines as a regular part of its diet (Hortling 1929-31).

A nest I studied in southern Finland contained only remains of small rodents.

SUMMARY

(1) A summary is given of the published information on the food of seventeen diurnal birds of prey and ten owls in Scandinavia and Finland. The species concerned, which are dealt with under individual headings, are Golden Eagle (*Aquila chrysaetos*), Buzzard (*Buteo buteo*), Rough-legged Buzzard (*B. lagopus*), Sparrowhawk (*Accipiter nisus*), Goshawk (*A. gentilis*), Kite (*Milvus milvus*), Black Kite (*M. migrans*), White-tailed Eagle (*Haliaeetus albicilla*), Honey Buzzard (*Pernis apivorus*), Marsh Harrier (*Circus aeruginosus*), Hen Harrier (*C. cyaneus*), Osprey (*Pandion haliaetus*), Hobby (*Falco subbuteo*), Peregrine (*F. peregrinus*), Gyr Falcon (*F. rusticolus*), Merlin (*F. columbarius*), Kestrel (*F. tinnunculus*), Eagle Owl (*Bubo bubo*), Snowy Owl (*Nyctea scandiaca*), Hawk Owl (*Surnia ulula*), Pygmy Owl (*Glaucidium passerinum*), Tawny Owl (*Strix aluco*), Great Grey Owl (*S. nebulosa*), Ural Owl (*S. uralensis*), Long-eared Owl (*Asio otus*), Short-eared Owl (*A. flammeus*) and Tengmalm's Owl (*Aegolius funereus*). Some of these birds have been much better investigated than others. The food percentages given (mostly rounded) are by number and not by weight.

(2) Summaries of this kind can be misleading unless the effects of individual specialisation and of differences in habitat and the availability of food are borne in mind. In addition, some prey species leave much more recognisable remains than others.

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Studies of less familiar birds

113. Broad-billed Sandpiper

By I. C. T. Nisbet

Photographs by G. des Forges, P. O. Swanberg and

D. A. Urquhart

(Plates 51-54)

ALTHOUGH MUCH has been discovered in recent years about the lives of Palearctic waders, that of the Broad-billed Sandpiper (*Limicola falcinellus*) is still largely a mystery. It occurs in most parts of Europe and Asia, but neither its summer nor its winter range has been fully worked out, and very little is yet known about its breeding biology. Its obscurity seems to be due mainly to its secretive behaviour in the breeding season, and to its allegedly nondescript appearance in winter plumage. However, as Browne (1955) has pointed out, this species is really quite distinctive in the field, and there seems no reason why it should not become better known.

It is known to breed over much of Scandinavia, from arctic Norway and Finland south to the mountain bogs of southern Norway and central Sweden. To the east, it is thought to breed right across European Russia and Siberia to the Pacific coast, but this presumption is based entirely on records in winter and on passage (Harber 1955), and there is not one definite breeding record from the whole of this vast area!

Most reference books state that the western populations winter around the Black and Caspian Seas and the eastern Mediterranean, but I have found little evidence for this except a few records of straggling individuals. It is certainly known to winter in small numbers in Egypt (Meinertzhagen 1930), but it apparently does not do so in the Black Sea (Dementiev and Gladkov 1951), while recent observations have suggested that it occurs mainly as a passage migrant in such places as the southern Caspian (Passburg 1959), Cyprus (W. R. P. Bourne *in litt.*) and Greece (Bateson and Nisbet *in press*). Even at Aden, where some spend the winter, the numbers are much larger in the passage seasons (Browne 1949, Paige 1960). Hence it seems likely that there must be an important undiscovered wintering-area somewhere in east Africa. Farther to the east, it winters in the Persian Gulf (Meinertzhagen 1954), India (Blanford 1898), Burma (Smythies 1940), Indo-China (Dementiev and Gladkov 1951), the Philippines and Micronesia (Voous 1960); flocks have been seen in some recent years in south-east Australia (Hindwood and Hoskin 1954), and there is even a record in New Zealand (Sibson and McKenzie 1960—the bird illustrated in plates 52b and 52c). It is nowhere outstandingly numerous, but it is by no means “rare virtually everywhere”, as alleged by Voous (1960): flocks of 20-30 are commonplace in its normal haunts, H. P. Medhurst (*in litt.*) has seen as many as 500 in a day at Aden, and Smythies (1940) describes it as “abundant” on some parts of the Burmese coast. Indeed, Merikallio (1958) suggests that something like 11,000 pairs breed in Finland alone.

On migration the western birds occur regularly in Denmark, Sweden and Germany, and stragglers are seen at times as far west as southern France. To Britain, however, it is only a vagrant. *The Handbook* (1941) quoted about 20 records and some 11 birds have been reported since, but probably only about five of the latter would now be accepted in the light of modern knowledge of the species. Of the 25 fully acceptable British records, seven have been in spring (mid-May to mid-June) and the rest in late autumn (mostly mid-September to mid-October). On migration it is most likely to be found in salt-marsh creeks and on the muddy edges of salt lagoons, but it occasionally visits open muddy shores and inland waters.

The Broad-billed Sandpiper is an odd-looking bird, about as large

as the smallest of Dunlins (*Calidris alpina*), but with proportionately shorter legs (plate 51) and with a bill which would look long even on a large Dunlin. The shape of the bill is distinctive, rather heavy at the base and with a noticeable downward kink towards the tip (plates 51, 52b, 53, 54a). This long heavy bill, on a bird scarcely larger than a Little Stint (*C. minuta*), gives it a squat, ungainly appearance, which is only slightly relieved by its active feeding habits. In breeding plumage, adults are completely unmistakable, having a strikingly striped head and blackish upper-parts with rich buff longitudinal stripes (plates 51, 53 and 54). As many text-books point out, this plumage is superficially like that of a Jack Snipe (*Lymnocyptes minimus*), but in fact there is little danger of confusion with that species, since the general shape and appearance of the bird suggest a Dunlin or Little Stint. In winter plumage (plates 52b and 52c) adults are grey above and white below and look much like Dunlins, but the stripes on the head are still conspicuous and unmistakable. These markings consist of a white superciliary stripe separated by a narrow dark line from a second white stripe on the side of the crown. In the birds shown in the plates the dark line runs forward almost to the bill, but in most of the individuals I have seen in the field it appeared to stop above the eye, giving the impression of a single wide superciliary which divided into two behind the eye. As the plates suggest, the conspicuousness of the upper white stripe is rather variable: all the 30-odd Broad-billed Sandpipers I have seen in autumn showed it clearly, but Medhurst (*in litt.*) tells me that it does not show at all on a small minority of winter birds. Other plumage characters of winter adults include upper-parts slightly more coarsely marked than Dunlin's; breast more finely speckled; throat and belly pure white, not clouded or streaked; and a dark spot on the carpal joint, recalling a winter Sanderling (*Crocethia alba*) (though this is often hidden by the flank feathers). Immatures on autumn migration (in August and September) look much like summer adults, but the breast and eyestripes are suffused with buff, and the upper-parts are patterned in chequers of dark brown and buff. In flight the species shows less wing-bar than a Dunlin (sometimes none at all), but much white on the sides of the tail-coverts. The flight-note, unmistakable when known, is a dry *chr-r-r-reet*, which is more trilled than a Dunlin's note but lacks the musical quality of a Curlew Sandpiper's (*Calidris testacea*); it is much like the call of a Pectoral Sandpiper (*C. melanotos*), but is buzzier, with more of an "-ee-" sound. *This note and the double eyestripe are the best characters of the species in all plumages.*

Very little seems to have been published on the breeding of the Broad-billed Sandpiper since the scanty notes in *The Handbook* (1940), although it has been photographed at the nest several times. A typical

habitat of this species can be seen in plate 52a. It breeds secretively in quaking bogs, hiding its nest in tussocks of vegetation surrounded by treacherous semi-liquid mud; several pairs may be found together and Merikallio refers to "colonies". Plates 51, 52d, 53 and 54 show typical nests, while others were illustrated in this series in 1947 (*Brit. Birds*, 40: plates 16-18). Davidson (1952) described a striking song-flight, in which this bird, usually skulking and secretive, "rises several hundred feet over its native bog, gliding gradually downwards in wide sweeps on quivering outstretched wings, uttering a continuous wheezy trill like a distant alarm clock". However, no one seems to have witnessed its courtship displays, nor have its incubation and fledging periods been determined. A thorough study of this odd little bird would be a very worthwhile project for anyone fortunate enough to spend a summer in its breeding area.

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Notes

Preening in flight.—So often one does not know what is unusual until someone else says it is. I refer to the publication of a note on a Little Gull (*Larus minutus*) preening in flight (*Brit. Birds*, 54: 117)



Some attitudes adopted by (left to right) Black-headed Gull (*Larus ridibundus*), Swifts (*Apus apus*) with wings elevated and depressed, and White-winged Black Tern (*Chlidonias leucopterus*) when preening in the air (see text) (sketches: D. I. M. Wallace)

and the brief editorial comment following it. Since then I have been sifting through my records and find that I have seen preening in flight by six species of two families:

- | | |
|---------|---|
| Laridae | Common Gull (<i>Larus canus</i>), adults in winter |
| | Little Gull (<i>Larus minutus</i>), immature in October |
| | Black-headed Gull (<i>Larus ridibundus</i>), adults and sub-adult in winter |
| | White-winged Black Tern (<i>Chlidonias leucopterus</i>), adult in October |
| Apidae | Swift (<i>Apus apus</i>), adults in May and June |
| | Pallid Swift (<i>Apus pallidus</i>), adult in May |

In the case of the Laridae, it is presumably their power of supremely buoyant flight that allows the convenience of preening in the air. The White-winged Black Tern was still in moult and I saw several feathers drop from its body plumage. With the swifts (and considering the speed of their flight) it may be that any feather out of place damages the aero-dynamic efficiency of the birds and, therefore, their removal or replacement is rather more imperative than convenient.

D. I. M. WALLACE

Black Duck in Co. Wexford.—On 18th February 1961, I discovered a strikingly dark Mallard-type duck, which I immediately recognised as a Black Duck (*Anas rubripes*) of eastern North America, on the west channel of the North Slob, Co. Wexford. Other ducks present at the time included about a thousand Wigeon (*A. penelope*) and a few Mallard (*A. platyrhynchos*), Teal (*A. crecca*), Pintail (*A. acuta*) and Shoveler (*A. clypeata*). The Black Duck soon flew off over Wexford Harbour, but fortunately it was seen again in almost the same place (between Begerin Bridge over the channel and the pumping station on the seawall) on at least the next three days. Major and Mrs. R. F. Rutledge were able to confirm my identification on 20th February and I last saw the bird on the 21st, after which I left the area. Observers who looked for it on the 25th, and subsequently, were unable to find it.

The following description is based on details I wrote down at the time and on notes later supplied by Major Rutledge.

At rest, the sooty-brown back, wings, under-parts and tail made it easy to pick out from the other ducks. In size it resembled a Mallard, though its dark colour perhaps made it look a little larger. In contrast to the rest of the body, the head and neck were pale buffish, except for the crown and nape and a stripe through the eye, which were dark. The bill was similar in shape to that of a Mallard and yellow in colour with a slight greenish tinge. Even when the bird was on the water, it could be seen that the deep blue speculum did not have broad white margins as in the Mallard. In flight this feature was particularly noticeable, though the white tips of the secondaries did form a narrow band along the hind edge of the wing. Another striking feature in flight was the contrast between the sooty belly and the silvery-white linings on the under-sides of the wings.

This is the second Irish and European record of the Black Duck, the first being a specimen shot on 5th February 1954, near Mullinavat, Co. Kilkenny (*Brit. Birds*, 48: 341). In view of the unusually disturbed weather conditions over the North Atlantic during the autumn, with numerous eastwards-moving cyclones, and the fact that a number of Nearctic vagrants occurred in Britain as a result, it seems reasonable to believe that the Wexford Black Duck was not an escape from captivity. It certainly seemed wild and was easily disturbed.

C. J. CADBURY

Turnstones feeding on bread.—On innumerable occasions between the autumn of 1960 and the spring of 1961, at the South Gare breakwater, Teesmouth, Yorkshire, a wintering party of Turnstones (*Arenaria interpres*) were seen to eat white and brown bread and seed-cake, a type of food not mentioned in *The Handbook*. Various observers and I saw them feeding in this way on several occasions, but it was the lighthouse keepers who first noticed it. They told me that the birds had probably contracted the habit from some Feral Pigeons (*Columba livia*) which had been present in the autumn. The bread and cake were thrown out each morning and the Turnstones would be sitting and waiting on the wall with the pigeons. As soon as it was put out, they would immediately fly down and eat it. There was no doubt that they actually swallowed the food and did not just play with it. After the pigeons departed, the Turnstones continued the habit and became so tame that most or all of them were killed by the keepers' cat.

D. G. BELL

On 3rd September 1960, I came across a number of Turnstones (*Arenaria interpres*) on the shingle beach at Penzance, Cornwall. Two

of these had found hard crusts of bread, into which they were probing forcibly with their bills—sometimes standing on the bread to do so—without managing to dislodge even the smallest piece. After each unsuccessful attempt they would flick the bread to one side and then feed in the normal manner. Eventually, however, the incoming tide reached the crusts and quickly softened them. The birds then pulled them rapidly apart and swallowed fairly large pieces.

BERNARD KING

[We should be glad to have any further records of this interesting behaviour. It would be valuable to have observations of bread-eating by juvenile Turnstones in order to form some idea of whether they do it on their own initiative or because they follow the example of other birds. Dr. I. C. T. Nisbet watched a similar incident in the United States on 27th December 1957, at a public camp-site on the Caribbean coast of the Florida Keys. Every time a party of people finished their picnic and drove away, a flock of Turnstones flew up from the rocks and swarmed around *and over* the vacated picnic table, clearing up the scraps and crumbs left behind. The promptness with which the birds moved in when the picnickers left suggested this was a regular habit. Another case is mentioned by H. M. Hall (*A Gathering of Shore Birds*, New York, 1960).—EDS.]

Short-eared Owl mobbing Fox.—On 18th August 1960, I saw a Short-eared Owl (*Asio flammeus*) hunting at dusk over a meadow behind the sea-wall at Easington, Yorkshire. A Fox (*Vulpes vulpes*) appeared near the sea-wall and began to cross the field. The owl immediately began to mob it, diving at the animal's head rather as terns (*Sterna* sp.) at a nesting colony mob human intruders. As far as I could see, the Fox was not actually struck, though the bird pulled out of its dives only inches above the animal's head. The Fox took absolutely no notice of the owl's display and continued leisurely across the field. Short-eared Owls had only been seen irregularly in the area during the summer, so that it is very unlikely that the bird was defending a nesting site. The date would also be late for any but a second brood.

The owl made no attempt to mob me when I crossed the meadow a few minutes later.

P. R. EVANS

Short-eared Owls killing Weasels.—On 18th April 1961, at Stambridge, Essex, I found single dead Weasels (*Mustela nivalis*) at the roosts of two Short-eared Owls (*Asio flammeus*). One had wounds around its throat and neck, but was otherwise unmarked. The other had similar throat and neck wounds and, in addition, a patch of fur had been ripped from its hind quarters; this animal had been dead for several

days and maggots were present around the neck wound. *The Handbook* makes no mention of Weasels being attacked by these owls.

T. J. LAWES

Swallows rearing brood in Robins' nest.—The report of Swallows (*Hirundo rustica*) using the nest of a pair of Spotted Flycatchers (*Muscicapa striata*) (*Brit. Birds*, 54: 287) particularly interested me as I had just heard from my cousin, W. Grierson Macmillan, of a very similar occurrence at Balerno, Midlothian. In 1960 a pair of Robins (*Erithacus rubecula*) had a nest against the wall in his garage, on top of a beam supporting the rafters. Early in June 1961 Swallows were found to have laid five eggs in the nest without adding mud or other material to it. The young hatched and fledged successfully, but the mossy nest gradually disintegrated and, although a board was nailed up to support the remnants, the young Swallows ended up sitting on the beam. While the five fledglings returned to roost on an electric cable hanging from the rafters, the adult birds proceeded to build a genuine mud and straw nest nearer the door but in a similar site to the Robins' nest. Four eggs were laid and these hatched about 29th July, when the first brood could still be seen flying about the house. This is the first time that Swallows have nested at this house.

ANDREW T. MACMILLAN

Sand Martins nesting in a heap of sawdust.—With reference to the note by Dr. R. A. F. Cox on Sand Martins (*Riparia riparia*) nesting in a sawdust heap (*Brit. Birds*, 54: 205), we found a single pair in a similar site near Errogie, Inverness-shire, on 12th June 1961. The sawdust pile in this case was about nine or ten feet high, and a "cliff" had formed on the south-west side. Here there were some five or six nesting holes, though only the one was in use. This was roughly six feet above the ground. The sawdust had little or no reinforcement and although dry—at least on the surface—was compressed into quite a firm mass.

J. B. and S. BOTTOMLEY

[Two letters on this subject, drawing attention to published records from Suffolk and Sweden, appeared in our July issue (*Brit. Birds*, 54: 292).—EDS.]

Voice of the Whinchat.—An anxiety note of the Whinchat (*Saxicola rubetra*) which I do not find given in *The Handbook* seems worthy of mention. It is uttered frequently by both sexes when young are present and I have variously rendered it as a soft *chup*, *chip* or *tuup*; though somewhat louder than the flight call of the Chaffinch (*Fringilla coelebs*), it is so similar that one could excusably expect to see a Chaffinch passing. This note is often the first indication of the presence of

breeding birds and I find it is used far more than the chat-like *tic-tic*. It can be heard at some distance, is quite unlike any note of the Stonechat (*S. torquata*), and is an excellent aid to identification if the bird cannot be well seen. In June 1961, I discovered a pair of Whinchats and their young in Co. Westmeath—the first breeding record for that county—simply by hearing this call at a distance of nearly a hundred yards!

ROBERT F. RUTTLEDGE

Reviews

Atlas der Verbreitung palaearktischer Vögel. Part 1. Edited by Erwin Stresemann and L. A. Portenko, with contributions by G. Eber, G. Mauersberger and J. Szijj. Akademie-Verlag, Berlin, 1960. 98 pages including 20 two-coloured distribution maps. DM.28.

The specification for this atlas of distribution of Palearctic birds has been laid down with precision and executed with remarkable thoroughness. It has resulted in the most authenticated and detailed set of maps yet to have appeared. Basically each map consists of a red line demarcating a bird's breeding range. The line is drawn through a series of known localities on the perimeter of the range, each locality being pin-pointed and numbered. The numbers are the key to the localities concerned which are listed below each map, the list also showing the name of the recorder in each case and the bibliographical reference (apart from the few obtained by correspondence). Each record is dated, moreover, the authors rightly stressing the desirability of using observations as recent as possible when dealing with so fluid a subject as bird distribution, but in a number of maps over a quarter of the locality dates are more than 50 years old. This is a tribute to the great depth of research undertaken, but must risk reducing the reliability of the result.

A further feature of the list of locality records is that each is coded according to the nature of the observation (which may vary, for example, from the finding of a nest to the sighting of adults in the breeding season), and an indication is often given of whether the species was numerous or represented by, say, a single pair.

On most maps the numbered locality markers show pockets of breeding outside the main range embraced by the red line. The latter, of course, in linking specific localities, avoids the rather arbitrarily smoothed curves which often appear on maps of this sort. Exactitude of definition is assisted by the scale which, although varying from one map to another, is generally considerably larger than that of previously published distribution maps.

Each map is accompanied by a brief text giving notes on races and closely related species, range, ecology and migration.

The great merit of this atlas is that the reader is not asked to take anything on trust; each point on it can readily be ascertained and re-assessed, and the present reviewer welcomes the opportunity of acknowledging in advance the considerable help it will undoubtedly be in revising the maps in the *Field Guide to the Birds of Great Britain and Europe*. Yet a comparison between, for example, the map of the Ortolan Bunting in the present work and that in K. H. Voous's *Atlas of European Birds* shows many substantial differences in many widely separated countries; it suggests that it is inadvisable to accept any one method as the best way of arriving at the distribution of a species, that the literature may not yet contain all the answers, and that further research is necessary. Perhaps the appearance of this latest atlas will encourage widespread publication of up-to-date breeding records near the limit of a bird's range.

The atlas is planned to extend to ten parts and to cover some 200 species, chiefly Passerines, out of the total of about 800 in the Palearctic. The first part deals with a selection of warblers, buntings, shrikes, pipits, flycatchers and one finch and one creeper, and includes two purely Asiatic species. An important feature of the work, for western ornithologists in particular, is the contribution of the Russian co-editor, Prof. Portenko, who has searched much obscure literature to establish distribution in Soviet territories. P. A. D. HOLLON

Animal Vision. By R. H. Smythe. Herbert Jenkins, London, 1961. 250 pages; 102 line drawings and sketches. 25s.

Mr. Smythe is the author of a standard text on *Veterinary Ophthalmology* and an examiner in surgery for the Royal College of Veterinary Surgeons. From his professional knowledge stems his interest in the wider, general field of animal vision that forms the basis of his new book. In this he has attempted to deal with a vast, and at times complex, subject, in a manner that can be comprehended by the average, non-specialist reader, and there is, indeed, a great deal of information in this book to interest an enquiring mind. The astonishing variety of types of eyes, ranging from the extremely rudimentary "eye" of Nautilus and the "Portuguese Man-of-War" through to the complex eyes of some insects and the efficient eyes of the higher vertebrates, are described and discussed. Readers of *British Birds* will be mainly interested in the author's descriptions of birds' eyes and their special adaptations to the bird's way of life; for of all the senses, that of sight is the most important in directing the life of a bird.

However, the great complexity of the subject of animal vision, and the need for specialist knowledge in practically every branch of it,

have tended to defeat the author. Some of his generalities are especially open to criticism. Such phrases as "Bodily adornments cut no ice in animal courtship" and "Very few animals can determine the sex of another of the same species by visual examination" will astonish the ornithologist and perplex even the casual observer of birds. Many experiments have shown that, while posture and reaction are important factors in the mutual recognition of the sexes in many species of birds, colour and adornment may also play an important part in recognition, as, of course, they do in much bird display and courtship.

The book is lavishly illustrated, but the illustrations are of very variable quality. That Mr. Smythe can sketch well is shown, for example, by his head of a thoroughbred horse on page 51, but his publishers have served him ill in retaining the badly-styled, open script lettering with which he has captioned many of his line-drawings.

Altogether, I found this a book at once fascinating and frustrating, but if it stimulates the student, as well it may, to delve more deeply into the original papers that have furnished the information it contains, its purpose will have been served.

STUART SMITH

Nestboxes. By Edwin Cohen. British Trust for Ornithology, Oxford, 1961 (revised edition). 48 pages; 31 text figures and two photographic plates. 3s.

The new, enlarged edition of this excellent manual has been brought up to date and incorporates a great deal of information on new designs and materials which have been proved successful. It is a thoroughly practical and copiously illustrated work which will undoubtedly receive wide circulation not only in this country but also abroad, where the influence of the B.T.O. is steadily increasing. The variety of ideas the booklet contains is a tribute to the inventiveness of ornithologists, and the author is to be complimented for his insistence that previous designs which have failed to stand the test of practicality in the field should now be discarded.

A casual inspection will show how considerable has been the transition over the past few years from the primitive tit-boxes, with a useful life of two or three years, to durable boxes with inspection devices, which will attract a wide variety of species from tree-ducks to Wheatears and Swifts. The use of pre-cast wood-pulp and concrete, and moulded plastics, is likely to have a far-reaching influence and will be particularly welcomed by those who have had to face the labour and cost of frequent replacement of wooden boxes when engaged in long-term research. The rather high initial cost of these modern materials need not deter those willing to try their hands at making their own boxes by the methods given in the manual. The failure of

many designs of wooden boxes to exclude water should perhaps have received greater emphasis, though some warnings are certainly included; there is little doubt that insufficient attention to this is the cause of a high proportion of nesting failures among some species and also of rapid deterioration in the boxes. The use of plastic cement, such as Bostik, between all joints should be obligatory.

Excellent advice is given on siting and density, two subjects which are frequently misunderstood. The growing problem of predation receives well deserved mention. Anyone who has seen how quickly a Weasel learns to devastate a closely sited group of nest boxes must, however, wait for a future edition of this admirable manual for a solution to the problem. One small criticism: it is regrettable to find a B.T.O. publication continuing to use scientific names which have been superseded.

GUY MOUNTFORT

Letters

The breeding range of the Waxwing in Fenno-Scandia

Sirs,—May I be permitted to comment on the breeding range of the Waxwing (*Bombycilla garrulus*) in connection with the recent excellent paper on Waxwing invasions during 1956-60 (*Brit. Birds*, 54: 1-30). In this paper, R. K. Cornwallis published a map (Fig. 14) showing the normal breeding area and the range extensions in Fenno-Scandia in 1956, 1957, 1958 and 1959. Since the map is on a comparatively large scale (*cf.* Fig. 1 in the same paper and the maps in K. H. Voous's *Atlas of European birds* and in the *Field Guide*), I feel that readers may expect it to be correspondingly more accurate.

For this reason it seems worth noting that J. Cunningham, P. E. Naylor and I saw a number of Waxwings between 3rd and 13th July 1957 in areas west and north of those marked in Mr. Cornwallis's Fig. 14 as representing the normal breeding distribution and the 1957 extension. Our records of Waxwings for those eleven days were as follows:

Norway

Sör-Varanger (Pasvikelv): at Nyrud, at least eight on the 7th in a half-mile of thin swampy pine forest (*The Handbook* gives this habitat as "a favourite haunt"); between Dobbeltvand and Ellenvand or Ellejr., three on the 9th in dense pine forest; and at Skogly, near Vaggetemjr., one on the 10th in pines by a lake. When we were discussing the breeding population of Pasvikelv with our host at Nyrud, Mr. Schaaning, he opined that Waxwings were of annual occurrence as breeding birds in the wide heavily forested strath of the Norwegian/Russian border, adding specifically that 1957 was "a good year". The localities mentioned above are between 35 and 60 kilometres north-east of Lake Inari, Finland, through the middle of which Mr. Cornwallis has drawn the northern edge of his normal breeding distribution. Lakselv: one on the 11th in dense birch scrub; at about 70 N this is at least 105 kilometres further north than Mr. Cornwallis's limit.

Karasjok: noted as "in evidence" on the 11th, but numbers not recorded; this is about 50 kilometres north of the published limit.

Finland

Karigasniemi: at least ten on the 12th in a quarter-mile of mixed pine and birch forest about 35 kilometres north of the published limit. These birds were staying in the tops of particular trees and were clearly "in residence".

It should be stated that in no instance did we find a nest or obtain any clear evidence of breeding. Nevertheless, J. Cunningham had found Waxwings noticeably less numerous in the same areas in 1953 and we all assumed at the time that those seen in 1957 were breeding.

The Handbook gives the limit of the distribution of this species in Norway as 70°N. We did not record it north of this latitude, but south of it even our restricted observations suggest that in suitable habitats Waxwings can be more widespread in a year of plentiful food than Mr. Cornwallis shows and Mr. Schaaning's long local experience indicates that they do occur annually well to the north of Lake Inari. Perhaps the best guide to the Waxwing's northern limit in Eurasia is that of the July isotherm of 50°F., also quoted by Mr. Cornwallis, but in Fenno-Scandia this does not coincide exactly with the limit of tree-growth, which must be the primary external control on the breeding distribution of a tree-nesting species.

By these remarks I make no criticism of the conclusions and discussion published by Mr. Cornwallis. Indeed our records, while pointing to the presence of small and scattered breeding populations in areas to the north-west and north of the geographical limits taken by Mr. Cornwallis, also show that those populations are subject to a doubling-up process in good years, this being clearly allied to the direct southward extensions of the minimum area of breeding distribution detailed in his Fig. 14.

D. I. M. WALLACE

[There was a nest with eggs at Karigasniemi in June 1958.—I.J.F.-L.]

Bird names

Sirs,—Your correspondent, Mr. Louis J. Halle, claims (*Brit. Birds*, 54: 255-256) that there is a need for more definitive bird names, but we already have these in the form of the scientific nomenclature. From my own experience in Africa and elsewhere, I suggest that the scientific name is as easily remembered as the vernacular. Furthermore, it has the overwhelming advantage of precision and universal acceptance.

MICHAEL RAYNER

[Sad to say, the average Briton (unlike his counterpart on the Continent) is as reluctant to learn scientific names as he is to master foreign languages.—EDS.]

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

[These are largely unchecked reports, not authenticated records]

This summary is mainly concerned with the eight weeks from mid-June to early August and follows on after the one in our July issue (pages 293-296). It covers the rarer species and some first impressions of the early autumn movements.

NORTHERN AND AMERICAN WADERS

The return passage of waders began, as it often does, in the last week of June and gathered momentum during July. At first it was only the usual species which were involved—Dunlins (*Calidris alpina*), Ruffs (*Philomachus pugnax*), Common Sandpipers (*Tringa hypoleucos*), Greenshanks (*T. nebularia*), Green Sandpipers (*T. ochropus*) and so on. Then came a few Wood Sandpipers (*T. glareola*) and Spotted Redshanks (*T. erythropus*), but the latter were in smaller numbers than is often the case and it was left to the Little Stint (*C. minuta*) and, especially, the Curlew Sandpiper (*C. testacea*) to provide the fireworks.

Whereas the general pattern of the *Tringa* waders is fairly similar from year to year, the arrivals of these two species are quite unpredictable. Looking back for a moment on the last three autumns, one recalls that Curlew Sandpipers were extremely rare throughout the autumn of 1958, apart from a small crop of isolated reports in early October (*Brit. Birds*, 51: 443), while 1959 produced an avalanche of them in late August and mid-September (*Brit. Birds*, 52: 438), and 1960 saw a sizeable fall in mid-September. Similarly, there were few Little Stints in 1958, rather more in 1959, and a huge and unprecedented invasion in 1960 (*Brit. Birds*, 53: 531-533). This autumn is already different in that the first Little Stints and Curlew Sandpipers began to arrive in mid-July, and from about the 22nd the latter in particular were being reported in a number of eastern districts. One Curlew Sandpiper even appeared as far west as Radnorshire on 23rd July, the first record for that county. Thus, there was a considerable arrival of both these arctic Siberian species a month earlier than usual and most, if not all, were adults instead of the majority being juveniles as is usually the case; many of the Curlew Sandpipers were in red plumage. One wonders whether this unusually early arrival signifies a disastrously unsuccessful breeding season. Both species were mainly in parties of two to eight in late July and early August, but as many as twenty-eight Curlew Sandpipers were seen as far inland as Nottingham on 8th August and larger groups were reported in East Anglia about the same time.

Two other northern waders, one uncommon and the other rather rare, might also be mentioned here. There was a slight influx of Temminck's Stints (*C. temminckii*) on spring passage in the last ten days of May, during which time the species was reported in Kent, Surrey, Suffolk, Norfolk and Devon. There was then one at Grove Ferry (Kent) on 27th June, and the first autumn birds appeared at Stoke (Kent) and Dibden Bay (Hampshire) on 22nd and 24th July; on 9th August there was one near Nottingham. Broad-billed Sandpipers (*Limicola falcinellus*) are much less commonly recorded than their numbers in Fenno-Scandia might lead one to expect (see page 321), but one stayed at Teesmouth (Co. Durham) from 13th to 19th August (probably two on 14th and 19th) and another at Nottingham from 23rd to 26th.

The scattering of American species continues. The Wilson's Phalarope (*Phalaropus tricolor*) at Marazion Marsh (Cornwall) (*Brit. Birds*, 54: 295) stayed for over a month and was last seen on 21st July. Meanwhile, another Wilson's Phalarope remained at Nottingham from 16th to 28th July and a third appeared in

Ireland. A **Greater Yellowlegs** (*T. melanoleuca*) was identified at Shotton Pools (Flintshire) on 23rd July, a surprisingly early **White-rumped Sandpiper** (*C. fuscicollis*) was watched by many observers at Salhouse (Norfolk) during 28th-30th July (this species is usually more often seen in October and November) and the first **Pectoral Sandpipers** (*C. melanotos*) of the autumn were reported from Minsmere (Suffolk) and Stoke (Kent) on 9th and 12th August.

GULLS AND TERNS

Following the **Sabine's Gull** (*Xema sabini*) in Dorset in June (*Brit. Birds*, 54: 296), there were two adults at St. Ives (Cornwall) on 16th July and single ones on 19th and 22nd August. The same area produced four, possibly six **Mediterranean Black-headed Gulls** (*Larus melanocephalus*) in the three weeks from 31st July, two of them staying for at least ten and eighteen days. A summer adult was seen at St. Mary's Bay (Kent) on 9th August and the one at Hartlepool (Co. Durham) (*Brit Birds*, 54: 186) returned for the sixth successive season on the 11th. Earlier, there had been an adult at Lowestoft (Suffolk) on the 16th, an adult in summer plumage at Brighton (Sussex) on the 16th and 17th, and two adults, one in summer plumage and one in winter, at Shoreham (Sussex) on 25th July. The Cornish records are particularly interesting because it was only in 1960 that this species was first recorded in that county and it certainly appears to be getting much less rare on the south coast as a whole. In Sussex, of course, it has been seen with some regularity for several years. It is worth reflecting that twelve years ago this gull had been recorded only about a dozen times in the whole of Britain and Ireland.

Little Gulls (*L. minutus*) continue to increase in eastern areas of England, and in some places, even in early autumn, these birds are now seen with as much regularity as on the coasts of Angus and Fife, though in generally smaller numbers. On 30th July there were as many as eleven at Hurworth Burn Reservoir (Co. Durham), this number rising as high as 22 by 15th August. A total of five immatures were noted inland at two localities in Nottinghamshire on 8th August, and a single one as far west as Flintshire on 30th July.

The end of the first week of August also saw the start of a small but significant influx of **Black Terns** (*Chlidonias niger*). This reached a peak on the 8th when there were parties of fifteen to thirty in counties as widely separated as Somerset, Suffolk and Lincoln and some 65 at Shotton Pools (Flintshire), as well as smaller numbers inland in the Midlands. Earlier, there had been odd Black Terns in various counties from Kent and Surrey to Cornwall since mid-July. An adult **Caspian Tern** (*Hydroprogne caspia*) at Walthamstow Reservoirs (Essex) on 9th July was followed by another (or perhaps the same?) at Minsmere (Suffolk) on the 16th.

OTHER LARGE WATER BIRDS

Though the **Little Egret** (*Egretta garzetta*) has been reported with much greater regularity over the last decade, many of the records have been in May and June. It is therefore interesting that one was identified in Orkney on 30th July (it had just possibly been there since late June) and stayed until 5th August, on which day another was first seen in Anglesey; the latter remained until at least the 20th. Earlier, there had been one at Lodmoor, Weymouth (Dorset), from 17th to 29th June. A juvenile **Purple Heron** (*Ardea purpurea*) appeared at Sandwich Bay (Kent) on 30th July, while there was the usual scattering of **Spoonbills** (*Platalea leucorodia*) in July and August, in counties as far apart as Somerset, Kent and Suffolk.

A slightly unreal atmosphere among long-legged water-birds was provided by several obvious escapes. Two apparently wild birds which appeared on 1st June at Odstock, near Salisbury (Wiltshire), were at first assumed to be Common Cranes (*Megalornis grus*), but photographs clearly showed them to be **Sarus Cranes** (*M. antigone*), a reminder that imperfectly seen cranes may not be all that they seem. A

Flamingo (*Phoenicopterus ruber*) was observed at three localities in Essex between 28th June and mid-July, and what was presumably the same bird afterwards appeared at two places in Kent on 23rd and 24th July. This was an all-vermilion bird of the American race. Meanwhile, a much whiter individual was seen in flight at Hill Head, near Fareham (Hampshire), on 19th July. A south-east Asian **Black-headed Ibis** (*Threskiornis melanocephala*) at Grove Ferry (Kent) on 7th August was still present on the 12th. Of similarly dubious origin was an adult **Snow Goose** (*Anser caerulescens*) which stayed on Lockwood Beck Reservoir (Yorkshire) from 12th July into August. An eclipse male **Red-crested Pochard** (*Netta rufina*) at Hanningfield Reservoir (Essex) on 9th July and two at Seaton Burn (Northumberland) from the 8th to the 13th may or may not have been wild birds.

It is perhaps reasonable to conclude this section with mention of a **Cory's Shearwater** (*Procellaria diomedea*) at Hartlepool (Co. Durham) on 8th July. The first **Balearic Shearwater** (*P. puffinus mauretanicus*) of the autumn was seen at St. Ives (Cornwall) on 13th August.

BIRDS OF PREY

Following the influx of **Red-footed Faleons** (*Falco respertinus*) in May (*Brit. Birds*, 54: 294), the male on St. Agnes (Isles of Scilly) was seen again on 1st June, and it or another appeared near-by on St. Mary's on the 3rd and 4th. Later, on 21st June, a first-summer male was identified at Spurn (Yorkshire).

Turning now to the autumn movements, easily the most interesting record was an immature **White-tailed Eagle** (*Haliaeetus albicilla*) at Selsey Bill (Sussex) on 30th July. In this connection it is worth adding that we have also received preliminary details of an eagle at Branscombe (Devon) on 28th July. A **Kite** (*Milvus milvus*), possibly a young bird, appeared over Boars Hill (Berkshire) on 27th July and soon after, in early August, southern England had its first **Ospreys** (*Pandion haliaeetus*) of the autumn. Ospreys again reared three young at Loch Garten (Inverness-shire).

SMALLER LAND BIRDS

At the time of writing, there have not been many reports of unusual Passerines in August, though an **Aquatic Warbler** (*Acrocephalus paludicola*) was seen at Theale (Berkshire) on 2nd August and a **Great Reed Warbler** (*A. arundinaceus*) at Slapton Ley (Devon) on the 7th, while the first of the autumn's **Icterine Warblers** (*Hippolais icterina*), a young bird, was ringed at Minsmere (Suffolk) on the 12th. One or two **Hoopoes** (*Upupa epops*) were reported from southern counties and as far north as Derbyshire in late July and early August, without there being any real influx.

As a continuation of our last summary (pages 295-296), however, two more **Woodchat Shrikes** (*Lanius senator*) were subsequently reported for the late May/early June period—single adults at St. Agnes (Isles of Scilly) on 27th May and Dungeness (Kent) on 11th June. There was also another **Lesser Grey Shrike** (*L. minor*), an adult male near Scarborough (Yorkshire) for at least three weeks from 4th July. A male **Serin** (*Serinus canarius*) was identified at Slimbridge (Gloucestershire) on 13th and 16th July, and the year's long list of male **Red-headed Buntings** (*Emberiza bruniceps*) was further increased by appearances at Dungeness on 10th June and at Keyhaven Marshes (Hampshire) on 2nd July.

The spread of the **Collared Dove** (*Streptopelia decaocto*) continues and this year the species has nested in such widely scattered counties as Dorset and Cornwall, Nottingham and Lancashire, apart from the eastern districts where breeding is now well established.

In conclusion, it is worth looking at the effects of the summer on the Passerine breeding season, which in turn affects the autumn picture. The prolonged spell of dry weather in May and June had widely differing results. Some of the resident finches and those summer visitors which feed on flying insects—**Hirundines**,

Swifts (*Apus apus*), Spotted Flycatchers (*Muscicapa striata*) and so on—seem to have done well. But other species, such as warblers and tits, which rely on the caterpillar crop to feed their young, had a very poor time in the drought and many broods died in the nest. Reports of this came from a number of counties as far apart as Durham, Gloucester and Kent and we should be glad to receive any similar records. Two examples from the first group, the successful species, will serve to show how this has shown up in the autumn picture. Firstly, Sand Martins (*Riparia riparia*) began to move south in force as early as the second week of July, reaching a peak about the 16th/17th. At Romford (Essex) this passage was considered to be about ten days early and two out of a large number of young Sand Martins trapped on the 17th were found to be carrying rings put on them as nestlings in Nottingham and Yorkshire, the latter only eleven days earlier. Secondly, the size of the late summer population of Goldfinches (*Carduelis carduelis*) attracted comment in many parts of East Anglia and south-east England.

Notice

Possible charter flight to America for XIII International Ornithological Congress.—The cost of travel to the United States may cause a major reduction in the European attendance at the XIII International Ornithological Congress at Cornell University in June 1962 (for details see *Brit. Birds*, May 1961, page 212), unless a charter flight can be organised. Plans to charter an aircraft are in hand and if this becomes possible there will be a saving of about 50% in the air fare. However, these plans cannot be finalised unless the organisers are assured in advance that they can fill all the seats. It is important, therefore, that those who are interested should inform the travel agency concerned *within the next month*. At this stage no financial commitment need be made, but the organisers are anxious to compile a provisional list and will later give full details to those interested so that they can take firm decisions. The flight will be organised on the basis of a round trip of either two or three weeks, in order to enable those attending the Congress to take part in some of the excursions. Communications concerning the charter flight should be addressed to "13th International Ornithological Congress 1962", P.O. Box 845, W.D.O., London, W.1.

Requests for information

Colour-ringed Black-headed Gulls.—As part of a population and behavioural study of the Black-headed Gull (*Larus ridibundus*), 1,500 juveniles were marked in June 1961, at Ravenglass, Cumberland, with a black plastic ring on the left leg and a metal ring on the right. Anybody who sees one of these birds is asked to send details of date and locality to I. J. Patterson, Department of Zoology and Comparative Anatomy, University Museum, Oxford.

Colour-ringed Dunlins.—In an attempt to investigate the migrations of the Dunlin (*Calidris alpina*), the Ornithological Club of Uppsala is marking all birds of this species trapped between July and mid-September 1961 at Ledsjär, Sweden (60° 30'N, 17° 45'E), with a coloured ring on one leg and a numbered one on the other. Anybody seeing one anywhere is particularly asked to note not only the colour of the coloured ring, but also which leg it is on. Details of date and locality—with, if possible, the time of day and any information on the number of other Dunlins present and their length of stay—should be sent to Sven Uhlin, Gnejsvägen 3 B, Uppsala, Sweden. This project will be continued for several years and it will be much appreciated if readers will draw the attention of their friends to it.

Notice to Contributors

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

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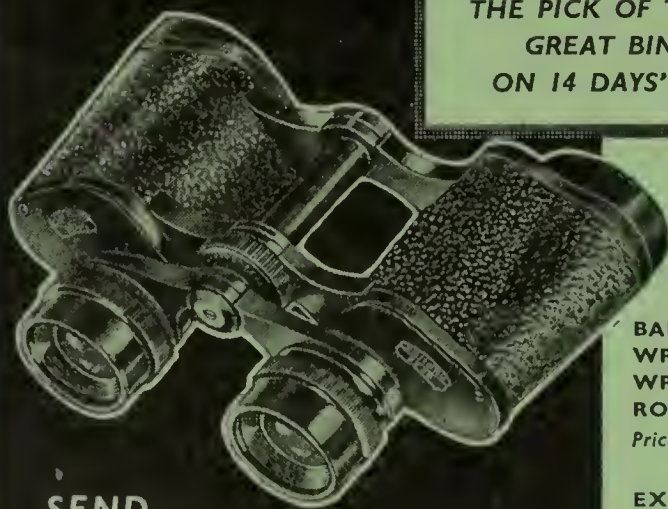
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British Birds

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and feeding in shore birds

John H. Sparks

Long-billed and Short-billed Dowitcher specimens
in the British Museum

Frank A. Pitelka

Dowitchers in Great Britain and Ireland

I. C. T. Nisbet

(with four plates)

Mallard feeding from dead birds

E. H. Gillham

Notes

- 3 OCT 1961

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Three
Shillings



September
1961

DEATHS FROM TOXIC CHEMICALS

In future, seed dressings containing dieldrin, aldrin and heptachlor will not be used at all for spring sown grain, and for autumn and winter wheat only where there is real danger from the wheatbulb fly. This is a step in the right direction, but the effectiveness of the ban and dangers from other chemicals must still be assessed. The utmost vigilance is still necessary, so please ensure that all deaths of birds or mammals which may be due to toxic chemicals are reported **PROMPTLY** to the BTO/RSPB Committee on Toxic Chemicals, The Lodge, Sandy, Bedfordshire

British Birds

AN ILLUSTRATED MONTHLY JOURNAL

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- 3 OCT 1961

PURCHASED

British Birds

Vol. 54 No. 9

SEPTEMBER 1961



The relationship between foot-movements and feeding in shore birds

By John H. Sparks

Department of Zoology, Queen Mary College, University of London

I SHOULD LIKE to make some observations which may serve to cast a different light upon the subject of foot-movements in shore birds, since in the literature there is a tendency to associate this behaviour with the luring of worms to the surface of the substratum. Swennen and van der Baan (1959) refuted this for marine worms, but, together with Simmons (1961), tended to propagate the idea that paddling movements have such a function when the birds are feeding on grassland.

At the outset I should like to consider two points:

- (i) the importance of marine worms (polychaetes) and earthworms (oligochaetes) in the diet of the birds which display the foot-movements;
- (ii) the effect of foot-movements on worms beneath the surface of the soil.

The importance of worms in the diet of birds

Polychaete worms are an important component of the invertebrate fauna of all shores, whether sandy or predominantly muddy, and there is little doubt that birds do take these organisms when circumstances permit. However, my observations on shore birds (which for the purposes of this discussion include both waders and gulls) seem to indicate that polychaetes are not a very dominant source of food. Two very common nereid worms of the muddy shore are *Nereis diversicolor* and *Perinereis cultrifera*, both of which reach a length of several inches. This represents a reasonable size when compared with the length of, say, a Dunlin (*Calidris alpina*). If polychaetes did form a considerable part of the food of our shore waders and gulls, tussles

between individual birds and worms would be a far more common sight than I have experienced. If analogies are sought, Blackbirds (*Turdus merula*) and Robins (*Erithacus rubecula*) are often observed in the act of extricating large oligochaete worms (*Lumbricus* sp.?) from garden lawns. Furthermore, Common Gulls (*Larus canus*) can often be seen devouring large worms on wet meadows or playing fields in our suburbs, but they are very rarely to be found loosening Lugworms (*Arenicola marina*) and other marine worms from the sandy and muddy shores where prodigious castings bear witness to the abundance of these animals.

At the same time, a consideration of the ecology of polychaete worms on the shore reveals that most of their population is inaccessible to such smaller waders as Dunlins and Sanderlings (*Crocethia alba*), and possibly also Redshanks (*Tringa totanus*), so that any inclusion of these marine bristle worms in the diet of these waders is fortuitous. A systematic search of the intertidal zone at Walton-on-the-Naze, Essex, which I made with a view to investigating the possible sources of food there for shore birds, showed that such species as the nereid worm *N. diversicolor* were always buried deeply in the London Clay substratum and quite inaccessible to smaller waders—although not deep enough to preclude them falling easy prey to the longer-billed Curlews (*Numenius arquata*) and Oystercatchers (*Haematopus ostralegus*). The bound shingle and sand overlying the London Clay was remarkably free from "worms", but underneath slabs of concrete of varying sizes lying about as a result of the disintegration of coastal defences, the mud was honeycombed with the mucous-lined burrows of the polychaete *P. cultrifera*. There was no evidence that their galleries extended far beyond the safety of the slabs.

It seems that, in the habitat which I have studied, most of the intertidal zone occupied by feeding birds is almost devoid of polychaetes excepting the sedentary Lugworms which, when reposed in the sand, are outside the distance penetrated by the bills of small waders and gulls. On other shores terebellid polychaetes such as *Lanice conchileger* may be abundant and could be utilised as food, but this is a sedentary tubiculous species with but limited powers of movement. Foot-trembling by Ringed Plovers (*Charadrius hiaticula*), paddling by gulls and jumping or sidgiting movements by Dunlin can be observed at Walton-on-the-Naze, but on no occasion have I seen a bird intercept and devour a worm after making these movements.

The effect of foot-movements on worms

It is apparent that much of the evidence for the surfacing of worms in response to gentle agitation of the substratum is confused and inconclusive, and simulation of the paddling activity of a gull on a wet

piece of grassland known to hold earthworms yielded negative results. Common Gulls perform paddling movements on wet grassland and are particularly efficient in detecting earthworms—two facts which early observers may have correlated and so confused cause and effect. If ground is flooded, earthworms tend to rise to the surface, probably in response to a deficiency of oxygen, and fall easy prey to birds.

The function of foot-movements

Paddling movements do take place on the shore, but, in their speculations as to the function of this behaviour, many writers have missed out an important step in the development of a logical argument. The repetitive raising and lowering of the feet does agitate the substratum, but it may be wise to look more closely at the effects before considering the function.

Most shores are composed of silt, sand and larger particulate matter, but a medium consisting of sand and more than one per cent organic matter displays the property of thixotropy. Chapman and Newell (1947) made a study of this phenomenon in relation to the burrowing activities of Lugworms. They found that resistance to penetration is greatly decreased after mechanical agitation which gives rise to the "quick sand" effect well known to anyone who has walked a sandy shore. These findings have some relevance to the problem under discussion since any activity which serves to agitate the substratum will reduce it to a semi-fluid consistency. Any organism lying reposed in a thixotropic medium will immediately begin to move to firmer ground as the agitation causes the surrounding area to become unstable. The organisms near the surface will rarely be worms, but the mid-shore at Walton is inhabited by innumerable amphipods (particularly *Bathyporeia pelagica* and *Gammarus* sp.) and Sand Shrimps (*Crangon vulgaris*). These can be detected easily by agitating the substratum with vertical movements of one's fingers on the surface. A sudden line of turbulence in the semi-fluid sand will mark the course of an amphipod scurrying for the safety of firmer sand.

Gulls often perform these movements in shallow pools left by the receding tide and it appears that under these conditions their feet would tend to sink beneath the surface, stirring up the sand and mud in a very efficient way (see also Swennen and van der Baan 1959). I saw Common Gulls and Black-headed Gulls (*Larus ridibundus*) pick objects deftly from the surface to their left and right while "paddling" in pools. I did attempt to simulate these movements with the undersides of my fingers facing upwards and found that the only detectable sources of food were small prosobranch gastropods of the species *Hydrobia ulvae*. Newell (1960) recently found that at low tide this small intertidal snail migrates beneath the surface of the muddy sand and

emerges to swim in the plankton as the tide rises over the flats. This fits in nicely with my own observations.

In conclusion, I would tentatively put forward the hypothesis that foot-tapping and paddling are adaptations to exploit the properties of intertidal muddy sand, in order to expose or incite movement in cryptic invertebrates of the intertidal zone. It is well known that the behaviour of birds is rather unadaptable to unusual situations and I have long held the view that the paddling of gulls on grassland is a direct result of this inflexibility. On the shore the paddling activities have some functional significance; on land the immutable feeding or hunting patterns are preserved, but the capture of earthworms near the surface and trampling movements are in no way related as cause and effect.

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Long-billed and Short-billed Dowitcher specimens in the British Museum

By Frank A. Pitelka

Museum of Vertebrate Zoology, University of California

UNTIL RECENTLY all the British and Irish records of dowitchers or "Red-breasted Snipe" have been assigned to the one species, *Limnodromus griseus*, recognised by American ornithologists (see A.O.U. Check-list 1931; Peters 1934). However, the excellent work of Rowan (1932) first called attention to evidence that there were really two species of dowitchers in the New World and subsequent studies have supported and extended his conclusions (Pitelka 1950, especially pp. 1-2 and 63-64 where a historical résumé of the problem is given). The taxonomic conclusions set forth in my 1950 paper were followed in the latest edition of the A.O.U. Check-list (1957). In brief, the Short-billed Dowitcher (*L. griseus*) breeds in subarctic parts of Canada and southern Alaska, whereas the Long-billed Dowitcher (*L. scolopaceus*) is an arctic species nesting in western and northern Alaska,

and in extreme north-western Canada and north-eastern Siberia.*

The question whether the British and Irish records included both species then arose. During a year spent in England in 1957-58, I took occasion to examine the specimens available in the British Museum (Natural History) in London, and I found that three had been taken in Britain. Two of these are Short-billed Dowitchers and probably refer to *L. g. griseus*, the easternmost of the three races of this species: one (No. 83.11.10.44) was killed in Middlesex in 1862, while the other (No. 50.11.5.37) is said to have been obtained in Cambridgeshire in 1843 (but see Nisbet 1961). The third specimen (No. B202A in the Vellum Catalogue) is a juvenile male taken in Devonshire, probably in 1801, and is certainly a Long-billed Dowitcher.

As this is the first proof of the occurrence of the recently separated Long-billed species, I should like to set down the evidence on which my identification was based. Firstly, the measurements fall within the range of males of *L. scolopaceus* (see Table 17 in Pitelka 1950). The wing is 143 mm., the bill 63 mm. and the tarsus 38.6 mm. Similar measurements, however, could be obtained from a juvenile female of the eastern race of the Short-billed Dowitcher (see Table 24 in Pitelka 1950). The specimen is dirty, but its colour characters are clearly diagnostic. Its under-parts are buffy grey to white, with a minimum of distinct speckles or dots, as is true of *L. scolopaceus* (not predominantly warm buffy with numerous small, sharply clear dots over the lower neck and breast, as in *L. griseus*). The juvenile feathers remaining on the back are dark, edged narrowly with dull buff (not edged broadly with comparatively bright buff, along with buff subterminal marks, to the extent that the buff almost prevails over the ashy brown). The tertials are dark, again merely edged narrowly with buff (not with broad buff edgings plus irregular subterminal bands of buff). The rectrices are dark, the blackish-brown bands being broad (not about the same width as the white bands). Most, but not all, of these points are reasonably well illustrated by plates 7, 8 and 9 in my 1950 paper wherein the characters distinguishing the juvenile plumages of the two dowitchers are also summarised in Table 4 (reproduced as Table 4 in Nisbet 1961).

On the strength of this specimen I concluded that the Long-billed Dowitcher should be added to the British and Irish list. Incidentally, I have also examined the details of two sight records which I consider

*It should be added that an Asiatic species, the Snipe-billed Godwit ("*Limnodromus*" *semipalmatus*), is similar to the American dowitchers and also shows certain resemblances to the true godwits (*Limosa*), but is doubtfully connected with either. At the moment it is usually placed in a monotypic genus *Pseudoscolopax* (see Pitelka 1948, Sutton 1949). Its field characters are briefly treated in the paper which follows (Nisbet 1961).

refer to this species. These concern the birds seen near Brookland, Kent, in October 1946 (Beesley *et al.* 1947) and at Thorney Island, Sussex, in November 1959, a photograph of which is reproduced as plate 56b in this issue.

It might be thought that the Long-billed Dowitcher would occur only very rarely in Europe because, so far as is known now, it breeds no further east on the arctic coast of America than Franklin Bay, Northwest Territories. Yet the records of juvenile Long-billed Dowitchers taken in America in September and October, the main time of their autumn movements, include one for Nova Scotia and nine for New Hampshire, Massachusetts and New York (Pitelka 1950, pp. 25 and 70-71). For the same months and area there are only two specimens of older birds, one killed in September in its first complete moult and so about fourteen months old, the other obtained in October in adult winter plumage. Juveniles thus well outnumber older birds in this sample and there is evidently a wide fanning out over Canada of south-bound juveniles in autumn, with the result that they reach the Atlantic coast of Canada at the latitude of Nova Scotia and possibly even further north. In the light of these considerations, the probability of the occurrence of the Long-billed Dowitcher in Europe is higher than would be estimated merely on the basis of the breeding range and the main migratory movement through the western two-thirds of the United States.

I am indebted to P. A. D. Hollom and H. G. Alexander for their continuing interest in and encouragement of my preparation of this paper. I also wish to thank J. D. Macdonald and R. W. Sims for kindnesses during my visits to the British Museum (Natural History).

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Dowitchers in Great Britain and Ireland*

By I. C. T. Nisbet

(Plates 55-58)

THE PAPER BY PITELKA (1961) in this issue of *British Birds* shows that both the Long-billed Dowitcher (*Limnodromus scolopaceus*) and the Short-billed Dowitcher (*L. griseus*) have occurred in the British Isles. At the request of the editors, I am summarising here all the records of these two North American species in Great Britain and Ireland, and listing the field-characters by which some of the future visitors may be specifically identified. For completeness, I am also including notes on the Asiatic Dowitcher (*L. semipalmatus*), which might also occur in Europe as a vagrant.

THE NORTH AMERICAN DOWITCHERS

Long-billed (L. scolopaceus)

According to Pitelka (1950), the Long-billed Dowitcher breeds only on the north and west coasts of Alaska and in adjacent parts of Siberia and Canada (though this last was not accepted by Snyder 1957). It winters from California, Louisiana and Florida south to Mexico and Guatemala; it migrates mainly through the western half of North America, but small numbers also occur in autumn on the Atlantic coast from Nova Scotia southwards.

Short-billed (L. griseus)

Pitelka (1950) recognised three subspecies of Short-billed Dowitcher. The breeding range of the eastern race (*L. g. griseus*) had not been discovered in 1950, but Pitelka's suggestion that it must lie in the Ungava peninsula, east of Hudson Bay, has recently been confirmed† (Hall and Clement 1960). It migrates chiefly along the east coast of North America to winter in the eastern Caribbean, from Florida south to the coast of Brazil. The inland race (*L. g. hendersoni*) breeds from the west coast of Hudson Bay west to northern Alberta and north to the Great Slave Lake,† and winters around the Caribbean and in northern South America; it migrates mainly through the centre of the continent, but also occurs in fair numbers on the Atlantic coast from New England southwards. The third race (*L. g. caurinus*) appears to be confined to the Pacific coast, breeding in Alaska and wintering from California to Peru.

*A publication of the *British Birds* Rarity Records Committee.

†Note that the breeding ranges of *griseus* and *hendersoni* are erroneously interchanged in the map in Dementiev and Gladkov (1951).

Autumn migration on the Atlantic coast

The migration periods of the two species on the Atlantic coast differ considerably. The Short-billed Dowitcher is a very early migrant, arriving in the United States from the beginning of July onwards, and reaching peak numbers before the end of the month, when flocks of thousands occur on the coast between Massachusetts and New Jersey. The numbers drop off rapidly during August, and only stragglers are left in the north-eastern U.S.A. after the second week in September. The dates of the main autumn passage are given as from early July to early September in Massachusetts (Griscom and Snyder 1955), from 6th July to 24th August in New Jersey (Urner and Storer 1949) and from 15th July to 5th September in Maryland (Stewart and Robbins 1958).

The Long-billed Dowitcher is a very late autumn migrant on the Atlantic coast, arriving mainly after mid-September. J. Jehl Jr. (*in litt.*) has seen a flock in New Jersey as early as the middle of August, but the earliest juvenile examined by Pitelka (1950) was collected in Massachusetts on 29th August. (Pitelka also listed four July records of one-year-old birds, but regarded them as summering non-breeders.) The main passage period in New Jersey is from 19th September to 27th October (Urner and Storer 1949), and that in Massachusetts is from early October to early November, with stragglers to 21st November (Griscom and Snyder 1955).

On the basis of collected specimens, Pitelka (1950: 48) estimated that *L. g. griseus* outnumber *L. g. hendersoni* by two or three to one in the south-eastern U.S.A., and that both races together outnumber *L. scolopaceus* on the Atlantic coast by at least ten to one. At least for the north-eastern U.S.A., however, both these ratios are probably much too low, probably because relatively little collecting has been done during the main passage of *L. g. griseus* in July. Figures quoted by Urner and Storer (1949), Griscom and Snyder (1955), Bailey (1955), Nisbet (1959) and J. Jehl Jr. (*in litt.*) suggest that in autumn Short-bills outnumber Long-bills in the north-east by a hundred or even five hundred to one.

DOWITCHERS IN THE BRITISH ISLES

Excluding those rejected by Saunders (1899), I have traced 48 records of dowitchers in Great Britain and Ireland, but seven of these cannot now be regarded as authentic.

Rejected records

(1) A specimen of *L. griseus*, labelled "Cambridgeshire 1843" is in the British Museum (Natural History) in London (Catalogue No.

50.11.5.37). This specimen has never been recorded in print, but was acquired by the museum in 1850 from J. Baker, a taxidermist of Melbourn, Cambridgeshire. Baker was described as "a reliable naturalist" by Lack (1934), but many other specimens with British labels which he sold to the museum are highly improbable, and in the absence of independent evidence it seems best to regard them all as doubtful (see also Stevenson 1870: 349).

(2) The first specimen for Kent, listed by Ticehurst (1909) as "quite possibly shot in the county", lacks adequate data. The specimen is now in the Royal Albert Memorial Museum, Exeter, labelled "probably Kent" (*fide* C. V. A. Adams).

(3) Another specimen is said to have been shot in Kent in mid-December 1902 (Westrapp 1902), but the published evidence (Ticehurst 1909) is not convincing.

(4) The third Kent specimen (Ticehurst 1907) is one of the controversial "Hastings records", which are now regarded as doubtful (Hollom 1960).

(5) A Sussex specimen (Parkin 1912), the only spring record for the British Isles, must be rejected for the same reason as (4). The specimen is now in the Booth Museum, Brighton (No. 407).

(6) A sight-record of a flock in Kent on 5th November 1935 (Harrison 1953) is not convincing.

(7) A sight-record (Popham 1944) of one on Stanpit marshes, Hampshire, on 5th September 1943, "with Purple Sandpipers (*Calidris maritima*) and other waders", is not convincing.

Specimen records

Of the 23 fully acceptable specimen records, listed in Table 1, I have traced eight which still survive in museum collections. The remaining fifteen were accepted by Saunders (1899) or Witherby and Ticehurst (1908) and are probably reliable, although some of them seem to have been accepted on very flimsy evidence. In Table 1 I have included references to the published documentation of each record, and also given the characters on which my identifications are based (see Tables 3 and 4).

Sight-records

Of the 18 fully acceptable sight-records, listed in Table 2, seven can be specifically identified according to the criteria given later in this paper, but the remaining 11 are indeterminate. In most cases full field descriptions have already been published, but in a few other cases I have added unpublished field notes.

TABLE 1—SPECIMENS OF DOWITCHERS (*Limnodromus* spp.) FROM GREAT BRITAIN
AND IRELAND

Locality	Date	References and notes
A. Identifiable as Long-billed Dowitchers (<i>L. scolopaceus</i>)		
Devon	October, probably 1801	Now in British Museum (Nat. Hist.), London (No. Vellum B 202 A). First winter male identified by Pitelka (1961); weight 94 g (Montagu 1802)
Horsey, Norfolk	9th October 1845	Stevenson 1870. Now in Castle Museum, Norwich (No. 25.85). First-winter male identified by the writer from patterning scapulars and rectrices and from bill-length (62 mm.)
St. Mary's, Scilly Is.	3rd October 1857	Harting 1880. Specimen untraced. "E 63.5 mm.; neck smoke grey; back and scapulars black, edged with rusty red; tail barred with narrow black and white line under tail-coverts barred; shot on a fresh water pond" (Rodd 1857)
Largo, Fife	September 1867	Now in Royal Scottish Museum, Edinburgh (No. 1889.23). Immature; bill 70 mm. (measured by A. R. Waterston and G. Waterston; erroneously given as 57 mm. by G. 1872)
Portleix (=Maryborough), Leix	29th September 1893	Kennedy <i>et al.</i> 1954. Now in National Museum of Ireland, Dublin (No. 1894.6). Immature female; bill 69 mm. (measured J. S. Jackson); labelled "Oct. 1893"
Tipperary	about 9th October 1893	Kennedy <i>et al.</i> 1954. Specimen untraced. Bill 67.5 mm.; tarsus 40.5 mm.; wing 110 mm. (Barrett-Hamilton 1893)
B. Identifiable as Short-billed Dowitchers (<i>L. grisus</i>)		
Stone Bridge, Middlesex	autumn 1862	Harting 1866. Now in British Museum (Nat. Hist.), London (No. 83.11.10.44). Examined by Pitelka (1961), who reports (<i>in litt.</i>) that the specimen almost certainly belongs to the eastern race (<i>L. g. grisus</i>). Stated by Harting to have been obtained in October, according to Pitelka the plumage indicates it was shot not later than early September
Christchurch Harbour, Hampshire	September 1872	Kelsall and Munn 1905. Now in Cambridge Museums and Art Gallery, Leicester. Male largely in breeding plumage; identified by the writer from ventral plumage (Bb on Pitelka 1950 classification). Race not determined. Bill 60 mm., tarsus 35 mm., wing 144 mm.
Stanpit marsh, Hampshire	7th October 1902	Kelsall and Munn 1905. Now in Cambridge Museums and Art Gallery, Leicester. Juvenile female; identified by the writer from characters listed in Table 4. Bill 65.2 mm., tarsus 35 mm., wing 146 mm.; hence identifiable as <i>L. g. bendersoni</i> (cf. Table 3)

C. Unidentified specimens

Cumberland	25th September 1835	Macpherson and Duckworth 1886
Yarmouth, Norfolk	October 1836	Stevenson 1870
Devon	about 1837	D'Urban and Mathew 1895
Yarmouth, Norfolk	early October 1841	Stevenson 1870
South Huish, Devon	"winter" 1855	D'Urban and Mathew 1895
Norland Moor, Yorkshire	September 1864	Nelson 1907
Battersca, Middlesex	before 1866	Harting 1866
Lanarkshire	before 1869	Gray 1872
Southport, Lancashire	about September 1873	Oakes 1953
Tetney, Lincolnshire	15th August 1882	Cordeaux 1882
Crinan, Argyll	2nd September 1891	Harvie-Brown and Buckley 1892
? Lancashire	September 1891	Obtained in Preston market: not accepted as Lancashire record by Oakes (1953)
Penllergaer, Glamorgan	before 1899	Cardiff Nats.' Soc. 1901
Tresco, Scilly Is.	12th-17th September 1943	Dorrien-Smith 1945. Now in collection at Tresco Abbey (<i>vide</i> J. L. F. Parslow); not yet examined

TABLE 2—SIGHT-RECORDS OF DOWITCHERS (*Limnodromus* spp.) FROM GREAT BRITAIN AND IRELAND

Locality	Date	References and notes
A. Identifiable as Long-billed Dowitchers (<i>L. scolopaceus</i>)		
Brookland, Kent	9th-13th October 1946	Beesley <i>et al.</i> 1947
Thorney Island, Sussex	15th-22nd October 1950	Douglas and Jenkins 1951
Ribble marshes, Lancashire	28th October 1951	Harrison <i>et al.</i> 1952
Killingworth, Northumberland	28th September- 1st November 1959	Listed as indeterminate by Pyman (1960b); later identified from notes and photographs subsequently supplied by J. A. Bailey
Thorney Island, Sussex	2nd-11th November 1959	Pyman 1960b; Harber 1960; see also plate 56b
Akcagh Lough, Kerry	18th-28th September 1960	Ruttledge 1961
B. Identifiable as Short-billed Dowitcher (<i>L. griseus</i>)		
Cley and Salthouse, Norfolk	5th October-3rd November 1957	Seago 1958; for details see APPENDIX on page 357 and plate 57
2. Indeterminate records		
Ennion Moor and Marazion Marsh, Cornwall	19th October-7th November 1937	Walmsley 1938
colt Head, Norfolk	29th October 1950	Douglas and Jenkins 1951
colt Head, Norfolk	14th October 1954	Pochin 1955
lorth Slob, Wexford	29th September 1956	Ennion <i>et al.</i> 1957
lule Moss, Berwickshire	20th-30th September 1958	Pyman 1960a
ilbarrack, Dublin	19th October- 1st November 1958	Pyman 1960a; Ruttledge 1959; probably <i>L. scolopaceus</i>

TABLE 2—SIGHT-RECORDS *continued*

Blennerville, Kerry	3rd December 1958	Pyman 1960a
Frodsham, Cheshire	18th October 1959	Pyman 1960b
Gullane Point, East Lothian	29th September 1960	Ablett <i>et al.</i> 1960
Hamilton, Lanarkshire	8th-12th October 1960	Ablett <i>et al.</i> 1960; probably <i>L. scolopaceus</i>
Akeagh Lough, Kerry	11th October- 26th November 1960	Ruttledge 1961; probably <i>L. scolopaceus</i>

Summary

Up to and including 1960, there were 41 authenticated records of dowitchers in Great Britain and Ireland. Of these, 12 (six specimens and six sight-records) can now be referred to the Long-billed form (*L. scolopaceus*) and four (three specimens and one sight-record) to the Short-billed form (*L. griseus*); of the three specimens of *L. griseus*, one is identifiable as *L. g. hendersoni* and another is almost certainly *L. g. griseus*. Most of the remaining birds were recorded during the period (late September to early November) of the main migration of *L. scolopaceus* on the Atlantic coast of North America, and in many cases the field-characters and/or habitat preferences of the birds are also suggestive of *L. scolopaceus*. It seems safe to conclude that most of the British dowitchers have belonged to this species.

At first sight it seems surprising that *L. scolopaceus* should be more frequent in Europe than *L. griseus*, since the latter is at least a hundred times commoner on the east coast of North America. However, as I have already pointed out (Nisbet 1959), some other Alaskan waders are especially prone to reach Britain as vagrants, perhaps because of their tendency to migrate eastwards through North America at the outset of their autumn migration.

FIELD IDENTIFICATION

Except for the remote possibility of confusion with the Asiatic Dowitcher (discussed below), a competent observer in the British Isles should have no difficulty in identifying a North American dowitcher as such. Dowitchers are medium-sized waders, comparable in size and shape to Redshanks (*Tringa totanus*), but with relatively shorter legs and with long snipe-like bills (plates 55-58). In winter plumage they are grey above and whitish below, more or less spotted or barred on the flanks, and have noticeable whitish eyestripes (plate 56a); immatures in autumn are suffused with grey or buff on the breast, and more or less prominently marked with buff on the upper-parts (plates 55, 56b and 57). In flight they show indistinct pale tips to the secondaries, and a prominent white patch in the middle of the back, contrasting with the darker (barred) tail.

The two North American species are very difficult to distinguish with certainty in the field, chiefly because both are very variable, so that there is a certain amount of overlap in most field characters: this overlap is especially marked between the Long-bill (*L. scolopaceus*) and *L. g. hendersoni*, the more western of the two races of Short-bill to have occurred in Great Britain. However, well-marked individuals of the two species are very different, and some should be identifiable even by observers without experience of either. The problem of identification has been discussed recently by Pough (1951), Small (1958), Peterson (1960, 1961) and Eisenmann (1961), but none of these authors has given a complete discussion of all the important field characters.

Bill-length

There is much overlap in bill-measurements between the two species (Table 3), but extreme Long-bills (with bills twice as long as the head) can often be recognised by this character alone, especially if the bird can be photographed (plates 56b and 58). Some Short-bills have bills only one and a half times as long as the head (plate 56a), but this is rarely conclusive in the field since some Long-bills have bills almost as short.

Body-size

Long-bills appear in the field to average 5-10% larger even than *L. g. hendersoni*, a difference which is accentuated when the two species are together by the slightly longer legs of the Long-bill. (This difference is not shown by the weight measurements listed in Table 3, but J. Jehl Jr. *in litt.* tells me that the samples on which the figures are based are too small to be representative.) This feature is of little use in the field unless both species are together, but large Long-bills look at least as large-bodied as Redshanks, whereas most Short-bills are noticeably smaller. Again there is much overlap.

Wing-length

Although Long-bills are larger-bodied than *L. g. hendersoni*, their wings average slightly shorter (Table 3). This is reflected on the standing bird by a difference in the position of the wing-tip: on most Long-bills it falls short of the tip of the tail by up to half a centimetre, while on most Short-bills it extends up to half a centimetre beyond the tail (plates 56a and 57a). There is probably less overlap in this character than in bill-length or body-size, but until it has been investigated more fully in North America it is only safe to rely on it on well-marked individuals. It should also be stressed that a bird may occasionally fold its wing into an unusual position (e.g. plates 57b and 57c), so that

TABLE 3—MEASUREMENTS AND WEIGHTS OF DOWITCHERS (*Limnodromus* spp.) AND BAR-TAILED GODWITS (*Limosa lapponica*)

		Wing (mm.)	Culmen (mm.)	Tarsus (mm.)	Weight (gm.)
<i>Limnodromus g. griseus</i> (Short-billed Dowitcher)	♂♂	133-147 (139.3)	52.0-61.1 (56.08)	32.0-38.9 (35.23)	100-123 (105.7)
	♀♀	137-147 (141.2)	53.9-65.1 (59.95)	33.0-39.5 (35.76)	82-153 (119.3)
<i>Limnodromus g. bendersoni</i> (Short-billed Dowitcher)	♂♂	135-150 (141.9)	50.8-61.2 (57.14)	33.8-39.3 (36.62)	91-145 (108.4)
	♀♀	137-152 (146.2)	56.2-67.8 (61.86)	34.0-41.3 (37.88)	95-140 (114.8)
<i>Limnodromus scolopaceus</i> (Long-billed Dowitcher)	♂♂	132-147 (140.0)	54.4-65.7 (61.76)	35.0-40.5 (37.81)	90-114 (99.9)
	♀♀	139-152 (144.8)	65.8-78.5 (71.84)	38.1-44.6 (41.13)	93-131 (114.7)
<i>Limnodromus semipalmatus</i> (Asiatic Dowitcher)	♂♂	164-172 (169)	74.7-81.9 (80.1)	45.8-52.7 (50.7)	168-194 (181)
	♀♀	168-181 (174)	78.3-87.1 (82.9)	47.6-54.0 (50.8)	165-245 (190)
<i>Limosa lapponica</i> (Bar-tailed Godwit)	♂♂	202-216	72-83	46-51	160-298 (252)
	♀♀	211-227	95-106	—	255-293

The figures given are the observed extremes, with the means in parentheses. Figures for the Bar-tailed Godwit have been derived from Witherby *et al.* (1941) and Weigold (1926); weights of *L. g. griseus* have been supplied by J. Jehl Jr.; the remaining data have been drawn from Pitelka (1948 and 1950: Tables 7, 20, 21, 24). The figures for *L. g. griseus* and *L. scolopaceus* are confined to young birds on migration; those for *L. g. bendersoni* are averages from birds from all parts of the breeding range.

prolonged observation may be needed to determine the "normal" position of the wing-tip.

Plumage

There are differences between the adult breeding plumages of the two species, but nearly all the British records have been of juvenile or first-winter birds, so only these plumages will be considered here. Table 4 lists the differences between juveniles of the two species; the first-winter birds are much like winter adults, but some or all the juvenile tail-feathers and some juvenile scapulars are retained at least until November. Hence if a young dowitcher could be trapped in the British Isles it should be identifiable from the markings on the tail-feathers and scapulars alone.

In the field, the juvenile Short-bill is reasonably distinctive, being prominently buffy (usually finely freckled with darker markings) on the breast and fore-neck, and prominently marked with bold buff streaks and freckles on the upper-parts; the buff crown and light

TABLE 4—PLUMAGE DISTINCTIONS BETWEEN JUVENILE LONG-BILLED DOWITCHERS (*Limnodromus scolopaceus*) AND SHORT-BILLED DOWITCHERS (*L. griseus*)

(Copied, with permission, from Table 4 in Pitelka 1950)

	<i>L. scolopaceus</i>	<i>L. griseus</i>
Colour of dorsal patterning	Dark (reddish buff)	Light (light buff)
Extent of patterning	Buff areas narrow and linear; limited to feather margins	Buff areas relatively wide, their margins medial to rhachis often irregular; occurring on feather margins and also as subterminal and submarginal marks and bars
Edging of longer tertials	Very narrow and sometimes obsolescent; subterminal bars occasional	Conspicuous without exception; subterminal bars characteristic
Sides of face and neck	More grey	More buff
Barring of tail feathers	Wide, almost black	Bars less wide, dull brownish black
Colour of upper breast and neck	Light grey, indistinctly marked, washed lightly with dull buff	Prominently buffy, usually speckled

throat often give it a noticeably "capped" appearance. In contrast, the juvenile Long-bill is much greyer on the crown and under-parts, only slightly buffy and never noticeably spotted on the breast, and darker above, with relatively narrow feather-edgings which appear reddish-buff if seen well in good light. However, these points require much care, since some Short-bills are sufficiently warm buff to appear generally reddish in the field, while the moult to first-winter plumage makes *L. grisens* look much greyer and more like *L. scolopaceus*. In first-winter birds only two plumage characters are of any use in the field: some Long-bills still show *reddish*-buff edgings to some feathers on the upper-parts; and their under tail-coverts are usually prominently barred right across, whereas those of the Short-bill are marked with irregular dark spots.

Voice

Dowitchers are credited in the literature with a wide variety of noises, but in my experience only a few distinct calls are given by autumn migrants. The usual flight-note of Short-bills is a triple *küt-küt-küt* or *chü-chü-chü*; this call faintly resembles that of a Lesser Yellowlegs (*Tringa flavipes*) or a weak cry of a Greenshank (*T. nebularia*), but is faster and much less musical than either, with a metallic quality which slightly suggests the rattling call of a Turnstone (*Arenaria interpres*). The *küt* note is often uttered singly, grading over into a sharp *kyit* which is sometimes given in a rattling series when the bird is startled. The usual call of Long-bills is a shrill, prolonged *keeeek*, sometimes uttered in groups of three or more, and becoming a rippling trill if the bird is flushed suddenly.

The difference in flight-notes is usually considered in North America to be the most reliable field distinction between the two species, but Eisenmann (1961) and others have pointed out that it has never been *proved* that one species does not occasionally give the call of the other. However, such occasions must be very rare, since a number of observers with wide experience of these birds (including J. Jehl Jr., J. Baird and R. T. Peterson) have told me that they have *never* heard any one individual give the calls of both species.

Habitat

On migration the Short-billed Dowitcher is primarily a bird of open coastal mudflats, associating normally with such species as Grey Plover (*Charadrius squatarola*), Semipalmated Sandpiper (*Calidris pusilla*) and Dunlin (*C. alpina*), whereas the normal habitat of Long-bills is fresh-water pools, preferably with muddy bottoms and with some vegetation around the edges. Pitelka (1950) found a 90-95% segregation of the two species into fresh-water and salt-water habitats



Figure 61



PLATE 55. Juvenile Long-billed (left) and Short-billed Dowitchers (*Limnodromus scolopaceus* and *griseus*). In spite of their English names, there is a considerable overlap in bill-length and many individuals are not so well marked as these extreme examples. In juvenile plumage the Short-billed is much more buff below, with wider buff edgings on the feathers of the upper-parts and spotted under tail-coverts (these are barred on the Long-billed). Most of the plumage differences are lost, however, when the birds moult in late autumn. The Long-billed is slightly larger and has relatively shorter wings which do not quite reach the tip of the tail (but see plate 57). It also tends to frequent marshes while the Short-billed prefers mud-flats (pages 343-357) (sketch: D. I. M. Wallace)



PLATE 56. Three Short-billed Dowitchers (*Limnodromus griseus*) and a lone Turnstone (*Arenaria interpres*) to show the size, Florida, winter (photo: Allan D. Cruickshank). Below, Long-billed Dowitcher (*L. scolopaceus*) with a sizeable bill, Sussex, November 1959 (photo: G. des Forges). Note the positions of the wing-tips

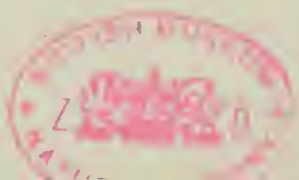
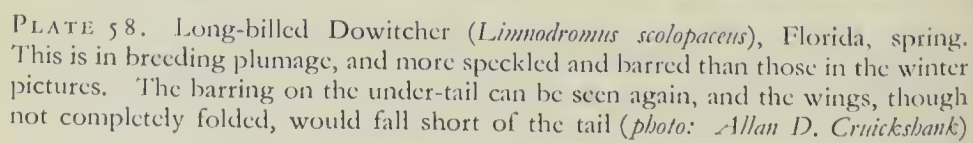


PLATE 57A. Short-billed Dowitcher (*Limnodromus griseus*) in the first-winter plumage, Norfolk, October 1957. Note the spotted under tail-coverts and the projection of the wing-tips a little beyond the tail (see APPENDIX, page 357) (photo: G. des Forges)



PLATES 57B and 57C. The same bird, its spotted under-tail again conspicuous, shows how the wing-tips can seem to fall short when not folded properly (page 349). Below, comparison with Dunlin (*Calidris alpina*) behind indicates the size (photos: R. P. Bagnall-Oakeley)





in California. This segregation is probably not quite so strict in eastern North America, but even there it is probably exceptional for a Long-billed Dowitcher to spend long on an open mudflat, or for a Short-bill to spend long on a fresh-water pool unless it can flight to salt-water flats near-by.

Summary

With the probable exception of the voice, there is some overlap in all these characters. However, under favourable conditions for detailed observation, well-marked individuals can be positively and safely identified by means of a combination of the characters of wing-length, plumage and voice, provided that the other points mentioned above (bill-length, body-size and habitat) are consistent. If they are not, it is safest to regard the identification as probable only.

Many American authorities (e.g. Pough 1951, Small 1958, Peterson 1960, Eisenmann 1961) do not regard specific identifications based on the above characters as 100% certain, because they believe that the characters have never been "proved" to be diagnostic by collecting specimens previously identified in the field. However, Griscom and Snyder (1955) reported that such proof has been obtained "many times", and this has recently been supported by the work of J. Jehl Jr. (*in litt.*), who has collected many specimens of *L. griseus* on the mudflats of New Jersey, but has never yet encountered an individual which showed the characters here attributed to *L. scolopaceus*. Hence reliable specific identification is certainly possible in favourable circumstances. This should not be taken to imply that *all* birds can be identified in the field, even by experienced observers: a good many confusing individuals occur which are best left unidentified, at least until more work has been done in North America on the relative importance of the various characters.

THE ASIATIC DOWITCHER

A similar species, *Limnodromus* (*Pseudoscolopax*) *semipalmatus*, breeds in central Asia and might conceivably occur in Britain in the future. It has been referred to in the literature under various names—"Red-breasted Snipe", "Red-breasted Sandpiper", "Semipalmated Snipe", "Oriental Dowitcher" and "Snipe-billed Godwit"—but "Asiatic Dowitcher" seems more appropriate than any of these. Its scientific name is also in doubt, since some writers on Asiatic birds treat it as a subspecies of *L. griseus*, while Pitelka (1948) expressed doubts that it even belongs to the genus *Limnodromus*; the middle view was defended by Rand (1950). It breeds from the Baraba and Kulunda steppes (only 500 miles east of the European border) east to Mongolia, and winters from India east to Sumatra (Dementiev and Gladkov 1951);

there is a sight-record of a flock as far west as the Persian Gulf (Mengel 1948).

In general shape and plumage pattern the Asiatic Dowitcher resembles a Long-billed Dowitcher, but is considerably larger (about the size of a Greenshank *Tringa nebularia*), and is less spotted and barred below, especially in breeding plumage (for coloured plate see *Ibis*, 1909, plate VII). In all these respects it is intermediate between a Long-billed Dowitcher and a Bar-tailed Godwit (*Limosa lapponica*), and Dementiev and Gladkov (1951) even suggest that it cannot be distinguished from the latter species in the field. However, it is distinguished from both by a white wing bar at the bases of the primaries and secondaries (in addition to the white tips to the secondaries common to both *L. griseus* and *L. scolopaceus*) and by prominent black bars across the white back. Its voice on the breeding grounds is rendered *krü-rü, krü-rü* (Velizhanin 1926, Johansen 1960), but its call on migration has not been described. Breeding colonies are situated "on boggy meadows with muddy soil, small pools and sloping banks" (Velizhanin 1926); Mengel's (1948) winter birds were seen "on the shallow water of an inlet" and "scattered over several acres of mud-flats".

SUMMARY

(1) The Short-billed Dowitcher (*Limnodromus griseus*) breeds in subarctic Canada and migrates in large numbers down the Atlantic coast of North America in July and August. The Long-billed Dowitcher (*L. scolopaceus*) breeds in Alaska and migrates in very small numbers down the Atlantic coast in October.

(2) There are 41 authenticated records of dowitchers in Great Britain and Ireland. Of these 12 (six specimens and six sight-records) can now be identified as *L. scolopaceus* and four (three specimens and one sight-record) as *L. griseus*. The majority of the indeterminate records probably refer to *L. scolopaceus*. Of the three specimens of *L. griseus*, one is identifiable as *L. g. hendersoni* and another is almost certainly *L. g. griseus*.

(3) There are small differences between the two species in bill-length, body-size, wing-length and plumage, and large differences in voice and habitat preference. Some (but not all) birds can be reliably identified in the field in favourable conditions.

(4) Notes are also given on the Asiatic Dowitcher (*L. semipalmatus*).

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Appendix—Short-billed Dowitcher in Norfolk in October 1957

The dowitcher seen at Cley and Salhouse, Norfolk, between 5th October and 3rd November 1957 has been included in Table 2 as *L. grisens*. Since no plumage details were published with the original record (Scago 1958), and since there are only three other definite British records of this species (Table 1), the evidence for this identification is given below. It is derived from field-notes made by R. P. Bagnall-Oakeley, M. J. Carter and P. R. Colston, field-sketches by D. I. M. Wallace, and coloured films (later examined by the writer) by R. P. Bagnall-Oakeley.

The size, shape, bill-length and plumage pattern are well shown in the various photographs taken by Bagnall-Oakeley and G. des Forges (plate 57). At rest the wing-tips were noted as extending to the tip of the tail (Carter), or slightly beyond it (Wallace); the films suggested that they usually projected a few millimetres beyond the tail (plate 57a), although occasionally the wing was held so that they fell slightly short of the tail-tip (plates 57b and 57c). On 5th October the breast was strongly suffused with warm buff and slightly speckled, but it soon afterwards became almost uniform pale grey (films). The edgings on the upper-parts were described as pale grey-brown (Carter), light-brownish grey (Wallace), or pale greyish-buff (from films); close examination of the wing-coverts (Carter) and scapulars (films) showed that the buff markings were present as submarginal marks as well as tips and edgings. The whitish bars on the tail-feathers were very slightly wider than the dark bars (films). Under tail-coverts were spotted (plate 57b). According to Bagnall-Oakeley, the usual call was a triple note corresponding to the text-book rendering *do-witch-er*, but it also at times gave a single note; the latter call was the only one heard by Carter and Colston on 19th October, when it was described as a penetrating *quip* or *kip*, something akin to the calls of a Little Stint (*Calidris minuta*) or a phalarope (*Phalaropus* sp.), although much louder. The bird flew freely between two brackish lagoons and a fresh-water pond.

Mallard feeding from dead birds

By E. H. Gillham

THERE APPEAR TO BE few published accounts of ducks feeding from dead birds. *The Birds of the London Area since 1900* (1957, p. 133) mentions several observations of Mallard (*Anas platyrhynchos*) seizing and drowning House Sparrows (*Passer domesticus*) and on at least two occasions the victims were swallowed (*Royal Parks Report 1929*: 4). More recently, there has been a record of mine (*Brit. Birds*, 51: 425) of

a female Tufted Duck (*Aythya fuligula*) swallowing a two-thirds grown embryo from one of its own eggs.

Between June and August in the years 1958-61 inclusive, I made a total of 40 observations of Mallard feeding from dead birds in St. James's Park, London. In most cases the birds were already dead when the Mallard found them. The largest corpse was that of a Woodpigeon (*Columba palumbus*). Most attempts at eating were by single adults, but on one occasion five young Mallard about six weeks old were busy on a corpse the size of a Starling (*Sturnus vulgaris*). Not all the corpses were identifiable, but they may be summarised as follows:

Mallard (small downy ducklings)	4
Small downy ducklings of Mallard type	3
Tufted Duck (small downy ducklings)	5
Woodpigeon	1
House Sparrow	7
Starling-sized birds	19
Pigeon-sized birds	1

In two cases, one involving a House Sparrow and the other a small downy Tufted Duck, a Mallard was seen to do the actual killing and then attempt to eat from the corpse. Another House Sparrow and another small downy Tufted Duck were killed and then left by different Mallard, however, so killing is not always followed by attempted eating. Once, too, a downy Tufted Duck was attacked and left moribund by a female Mallard, but this duckling was finished off by a passing drake Mallard which promptly tried to eat it.

The efforts of the Mallard to eat from bird corpses were little different from their persistent struggles with large pieces of stale bread or large dead fish. Most of the corpses were floating in the water. The Mallard usually pulled at the body or wings, or vigorously shook the corpse to break off pieces. Where decomposition had set in, they pulled at the exposed flesh. They also made determined efforts to chew the heads of three House Sparrows, a duckling of Mallard type, a single downy Mallard and three downy Tufted Ducks. In one case the headless corpse of a small downy duckling, probably a Mallard, was swallowed whole after about eight minutes of persistent attempts. There were also repeated, but unsuccessful, attempts to swallow the corpses of five House Sparrows and a small downy Tufted Duck.

In the cases of head chewing, the heads and necks of the House Sparrows were practically denuded of feathers, but the downy Mallard, which I was able to examine after it had been left, had its head squashed right out of shape. Except where decomposition had set in, the corpses were not as badly mutilated as they would have been if raptors or crows had dealt with them. Apart from the

occasion when the whole corpse was swallowed, the only parts actually eaten were some head contents and head and body feathers and, almost certainly, small bits of flesh.

Notes

Manx Shearwater digging by daylight.—At about 2.30 p.m. on 15th May 1961, I was walking in bright sunlight on a sloping cliff on Skokholm, Pembrokeshire, when I heard a Manx Shearwater (*Procellaria puffinus*) calling from its burrow. Kneeling down with my face close to the entrance, I could hear much heaving and panting, and many gentle grunts and squeaks unlike the usual calls. The bird was trying to enlarge its shallow burrow. Small stones and earth were kicked out and, once, a pink-webbed foot appeared. After some ten minutes, the bird turned round in the burrow with an evident effort and put out its head and shoulders. It was panting and looked dishevelled; I could even see some earth in its eye. After a rest, it started picking at bits of grass and roots, then pushed them into the burrow with its bill. Next, using its bill as a tool, it made a shallow furrow right across the entrance and then dug systematically along it. All this time my face was within a foot of the bird, but it did not appear to see me and gradually pushed itself still further out. Eventually, I moved sideways and it came right out in bright sunlight, made a "hairpin bend" turn to the left, shuffled on its front with the aid of bill and claws, and disappeared down an adjoining hole which also looked uncomfortably low and narrow. M. D. CROSBY

[The Manx Shearwater's method of excavation was described as long ago as 1942 by R. M. Lockley in his book *Shearwaters* (p. 25), if not earlier. It seems unusual, however, to find so much activity from one in broad daylight, particularly on a bright and sunny afternoon. We showed this note to Mr. Peter Davis, formerly warden of Skokholm bird observatory and now of Fair Isle, and he has commented as follows: "It is not uncommon to find shearwaters by day in shallow holes, or even in shady corners among rocks or walls. Presumably they are birds which do not own a proper burrow, or which have started to dig one but delayed going to sea until it was too light to depart. Often there is newly dug earth around such birds, but I do not recall watching one digging by daylight. However, it would certainly be expected that in such circumstances a shearwater would try to conceal itself more adequately by deepening the hole. Miss Crosby's bird may not have noticed her at first, but the alacrity with which it fled to the neighbouring hole suggests that it had done so before she moved out of the way. In fact, the digging of the furrow

across the entrance may have been a displacement reaction to her presence."—EDS.]

Distribution of Common Scoter in winter off southern Ireland.

The reference books all suggest a scarcity or absence of the Common Scoter (*Melanitta nigra*) off the coasts of the southern half of Ireland. In *The Birds of Ireland* (1954) we took our cue from the earlier work of the same name by Ussher and Warren (1900) and from *The Handbook of British Birds* (1939), and stated that one has to go as far north as Dublin Bay before one regularly sees any numbers on the east coast. That was the extent of our information at that time. Later, however, I found Common Scoters in appreciable flocks off the east coast of Co. Wexford and decided that further investigation was necessary. Accordingly, I have searched the seas off Cos. Wicklow, Wexford, Waterford and Cork in the past few winters and interrogated fishermen and others. My investigations have been in the months from November to February to ensure that the birds seen are in their winter quarters and not part of the moving population occurring at other times.

Results show that on the east coast as far south as the entrance to Wexford Harbour the inshore waters are heavily and regularly populated. In several of the bays along the east coast of Co. Wexford—Courtown Harbour, Blackwater Harbour and Wexford Bay—I have made a number of counts ranging from 50 or 100 to over 400 and fishermen have given me similar reports. It seems unlikely that this is a recent development as the same fishermen have recognised the presence of this species for many years.

South of Wexford Harbour, from Rosslare to Carnsore Point, and in the likely-looking coastal waters westward along the south coasts of Cos. Wexford, Waterford and Cork—Ballyteigue Bay, Tramore Bay, Dungarvan Harbour, Youghal Harbour and Bantry Bay—the Common Scoter is no more than a very casual visitor in winter. It is probably significant that there are considerable banks off the east coast where the depth is five fathoms or less, while westwards from Carnsore Point such banks give way to deeper water with skerries and rocky shoals.

On the west coast of Ireland one does not find Common Scoters south of Clew Bay, Co. Mayo, until one reaches Co. Kerry. Here, however, F. King has recorded appreciable numbers wintering regularly in places where, in 1900, Ussher and Warren wrote that only a few occurred. His counts of big flocks on the Kerry coast have varied from 500 to 2,000 in Ballyheigue, Brandon and Dingle Bays. Incidentally, this south-west coast is not included in the map in *A Field Guide to the Birds of Britain and Europe*. It may also be added that in

the bays of this same part of the Kerry coast there is a very large summering population from June to August, varying from 400 to 5,000 and averaging about 1,000, with the maximum numbers in July. Very small and scattered flocks are also occasionally met with in summer along the coasts of Co. Cork. ROBERT F. RUTLEDGE

Behaviour of Woodpigeon towards fledgling Rook.—On 9th May 1961, at Hainault, Essex, I was standing near some trees in which there was a colony of Rooks (*Corvus frugilegus*) when my attention was attracted by the unusual behaviour of a Woodpigeon (*Columba palumbus*). At least three times, from a height of about three feet above the ground, it dived into some tall herbage. Then it fluttered on the ground at the same spot, its wings outspread and feebly flapping, much as though it were trying to fly without being able to spring into the air for the initial lift. I approached and it flew off normally. Investigation revealed a newly fledged Rook crouching in the herbage. Immediately adjacent was a large hawthorn containing a Woodpigeon's nest with two squabs three-quarters grown.

There is no doubt that the diving attacks and the fluttering display on the ground were all directed at the Rook. I was only about fifteen yards from the patch of herbage when the action took place and, though I could not actually see the Rook at the time, it was exactly in the place where the Woodpigeon was diving. The herbage was an isolated piece of cover less than a yard across in an area which had otherwise been cropped low by cows. When the Woodpigeon was fluttering on the ground, it was little more than two feet from where the Rook was lying. There were workmen digging in the vicinity and a gardener was standing not very far away, but I was left with the distinct impression that both they and I were outside the orbit of the Woodpigeon's concern at that time. In any case, the place was only about twenty yards from a fairly busy drive and the Woodpigeon must have been well used to human disturbance. Presumably it was the parent of the squabs and regarded the fledgling Rook as a predator which it first tried to drive off and then to lure away by feigning inability to fly. D. J. SUMMERS

[It is interesting to compare this note with the recently published observation on the display of a Woodpigeon towards two Magpies (*Pica pica*) (*Brit. Birds*, 54: 118-119).—EDS.]

Short-eared Owl stooping at cock Pheasant.—On the afternoon of 26th November 1960, I watched a Short-eared Owl (*Asio flammeus*) hunting an area of rough grassland near Wicken Fen, Cambridgeshire. The bird was flying leisurely some six feet above the ground, when it suddenly braked hard, hovered for a few seconds and dropped towards

the ground, talons lowered. The owl's potential victim proved to be a cock Pheasant (*Phasianus colchicus*), which rose sharply from the ground and uttered continuous alarm calls. As the Pheasant flew up, it hit the owl, but the latter made no attempt to grab it—I think the owl was too surprised, for it flew off rapidly in the opposite direction to the Pheasant! I can find no reference to Short-eared Owls attempting to take such large prey, though, according to Ralph Chislett in *Yorkshire Birds* (1953), they have been said to take young game-birds. It has been suggested that this incident was no more than play or accident, but the owl's actions gave every appearance of a serious attempt to catch prey and, if it was an accident, it was a gross error of judgement on the part of a predator hunting in good light. I searched the ground from which the Pheasant was disturbed and there was not sufficient cover for it to have been even partially hidden. A cock Pheasant can hardly be described as inconspicuous, either in shape or in colour, and so it would seem that the owl was well aware of the size of the bird at which it was stooping. P. R. EVANS

Skylarks feeding on kitchen scraps.—Mrs. F. E. Carter's recent note (*Brit. Birds*, 54: 245) brings to mind an observation I made ten years ago. From 23rd June to 7th July 1951, up to three Skylarks (*Alauda arvensis*) fed regularly in my garden at Liverpool. They frequently ate bread and cheese scraps or took them away, presumably to nestlings. They were also seen to eat fly pupae and, once, a piece of fried black pudding. The garden is situated on the edge of the town and was then no more than a piece of waste ground.

D. J. LOW

Swallows killed by brambles.—The recent publication of the death of a juvenile Sand Martin (*Riparia riparia*) on a burdock (*Brit. Birds*, 54: 246) prompts me to record a similar event. On 24th May 1961, at Getares, near Algeciras, Spain, I was looking for migrants in an overgrown stream-bed. Many Hirundines were feeding between its banks and some were resting periodically on the strands of overhanging vegetation. Hanging from a dead bramble were two bundles of feathers, both of which had recently been juvenile Swallows (*Hirundo rustica*). One was clearly impaled through the right wing, the other apparently caught by the body. A few adult Swallows were perching freely and safely in brambles near-by, but other juveniles, with their more unstable flight, seemed to be in some danger.

D. I. M. WALLACE

Swallows attacking Sand Martins' nest-holes.—Just outside Kilkenny, Ireland, there is a small sand pit which holds a colony of

about fifty pairs of Sand Martins (*Riparia riparia*). On 6th July 1961, I watched eight Swallows (*Hirundo rustica*) repeatedly trying to enter five of the occupied nesting holes. Several got halfway into the holes, but were pushed out by Sand Martins already in occupation. The latter then remained at the entrances and pecked off any further attempts at entry. I noticed several instances of Swallows clinging to the cliffs beside nesting holes and being dislodged by Sand Martins swooping at them. Finally, the aggressors flew off. The holes under attack were about fifteen yards from the main colony and only the ten occupants took part in defending them.

RAYMOND J. O'CONNOR

Grass roots ensnaring Jay's head.—On 6th August 1961, we visited a small wood near Colchester, Essex, and found a freshly dead Jay (*Garrulus glandarius*) ensnared in the thick roots of some grass at the base of a birch tree. We removed the corpse with some difficulty, having to pull at it quite hard. It appeared that the bird had been foraging in the roots of the grass and had somehow pushed its head too far down and then forward. Everything was entirely consistent with this and there was no evidence of any other agency at work. The bird was quite intact and seemed to be a young one in its first moult. The feathers of the head and chin were still in their quills.

A. K. WOOLSEY and B. FROST

Leaf-plucking behaviour of Nuthatches.—In the spring of 1958, while watching the nesting activities of a pair of Nuthatches (*Sitta europaea*) in my garden at Welwyn, Hertfordshire, I witnessed some interesting leaf-plucking behaviour. This was mostly a feature of the cock's activities during the hen's egg-laying and incubating period. At this time he developed a desire to remove leaves from the vicinity of the box in which he and his mate were nesting. On numerous occasions I saw him select and pluck a leaf, then take it away and drop it within about thirty feet. The leaves were taken from ivy (*Hedera helix*) on the tree trunk close to the nesting box, and from hornbeam (*Carpinus betulus*) overhead. He was very determined, and if, as sometimes happened, an ivy leaf proved hard to pluck, he would search for another and more tender one which came away easily. He also kept the nesting box free from any debris, such as catkins, which fell on it. The hen was seen to pluck a leaf only once. Unfortunately I could not tell how this might have developed, as the hen disappeared on the fifteenth day of incubation and was not seen again. I have watched the cock's nesting activities during the succeeding springs, and noted this behaviour again during April 1960.

I have seen a variation of this leaf-plucking by Nuthatches when

small companies of the birds collect in the trees in early autumn, apparently disputing territory. On these occasions activity reaches a high pitch of excitement. The birds keep up a chattering chorus, and peck vigorously at the nearest boughs, sometimes plucking leaves, though these are not taken away. EILEEN A. SOPER

Whinchat's nest surviving grass fire.—On 24th June 1961, at Holme Pierrepont gravel pits, Nottinghamshire, we found a hen Whinchat (*Saxicola rubetra*) sitting on four eggs in a nest in coarse grass on the side of a mound. At 3.0 p.m. on 4th July, there were still four eggs and the female was again on the nest. Later that day, at about 4.30 p.m., the thick dry grass surrounding the nest caught fire. We returned to the site at 5.30 p.m., at which time the grass was still smouldering. The cover round the nest was completely destroyed and the edges of the nest itself were badly singed, but the interior of the cup was unharmed and one of the eggs had hatched. As the nestling had not begun to emerge when the nest was examined at 3.0 p.m., it seemed likely that it had hatched about the time of the fire. The fact that the inside of the nest and its contents were unharmed raises the interesting question of whether the hen bird sat through the flames.

The nest was now completely exposed and so we placed some long grass over and around it, to protect it from predators and the weather. Two of the three other eggs also hatched successfully and, in due course, three fledglings left the nest. P. M. HOPE and G. E. PIPE

[Even though it is uncertain whether the female sat through the fire, this observation gives an idea of the insulating capacity of a nest and emphasises the reluctance of many birds to desert well incubated eggs or newly hatched young, even in the face of extreme disturbance. Fear of fire is normally very deeply rooted in all animals.—EDS.]

Pallas's Warbler in Yorkshire.—At 3.15 p.m. on 22nd October 1960, P.H.G.W. and J.M.B. found a small *Phylloscopus* warbler in some buckthorn on the peninsula at Spurn, Yorkshire. It was no bigger than a Goldcrest (*Regulus regulus*) and from its small size, its greenish colour with primaries and tail slightly darker, its conspicuous yellow superciliary and centre crown-stripe, and its pale lemon-yellow rump, they concluded that it was a Pallas's Warbler (*Pb. proregulus*). The description entered in the log at Spurn Bird Observatory also noted that it had whitish under-parts washed yellow on the throat and upper breast, and a short but conspicuous *single* yellow wing-bar. The absence of a second wing-bar was thought perhaps to be due to wear on the tips of the wing-coverts. It had a monosyllabic call note

(rendered as *swee*) and was very active, even "flycatching" at times. In all, it was under observation for about three-quarters of an hour at ranges down to six feet.

Early the following morning, the 23rd, the bird was found again within a hundred yards of where it had last been seen at dusk the previous evening. It was subsequently trapped, weighed, ringed, photographed and released. A very detailed description was entered in the observatory records and the following is a summary of it:

Upper-parts: crown olive-green with black tips to feathers (particularly those at rear); very distinct lemon-yellow superciliary on each side, these meeting above the bill, and a paler stripe down centre of crown (all three stripes broadened on to the nape, giving a stripy appearance against the darker feathers there); dark grey eye-stripe circling round in a hook shape near nape; ear-coverts olive-yellow with smoky edges; mantle, scapulars, back, and upper tail-coverts pure olive-green with no dark tips to feathers; rump conspicuous pale lemon. *Wings and tail*: primaries smoky brown with outer webs yellow-green and inner webs edged with pale greyish-white; secondaries as primaries but with basal quarter of outer webs brown-olive, this colour protruding 5 mm. beyond the coverts; tertials as secondaries but with outer edges and tips of the innermost two whitish lemon-yellow; primary coverts as primaries but with broader outer edgings; greater and median coverts dark grey-brown with broad lemon-yellow tips forming conspicuous *double* lemon-yellow wing-bars; lesser coverts greyish-brown with broad olive-yellow edgings and tips; tail feathers grey-brown tinged olive with bright yellow-green edgings. *Under-parts*: mainly off-white but tinged greyish on throat and tinged yellow on breast; under tail-coverts more yellowish; axillaries bright lemon-yellow. *Soft parts*: bill blackish-brown with pale horn tip and light reddish-brown base to lower mandible; gape yellow; legs greyish-brown; claws yellow-brown; iris dark brown. *Measurements and wing formula*: wing 49.5 mm., tail 38 mm., tarsus 15 mm., bill (from skull) 10 mm., weight 4.61 gm.; 4th primary longest, 3rd and 5th —0.5 mm., 6th —1, 7th —5, 2nd —6 (about equal to 8th), 1st 9 mm. longer than primary coverts; 3rd to 6th emarginated, 6th to 10th and all secondaries sharply pointed.

The plumage description and measurements were taken by R. F. Dickens, P. J. Mountford, Col. H. G. Brownlow, M. Densley, Miss C. Shaddick and P.H.G.W. The bird was also seen in the hand by Mr. and Mrs. E. C. Sterne, K. C. Briand, I. H. Wright, D. A. Rushforth, H. E. Scott, Miss M. Wray and Miss D. Walker. When released, it perched within a few feet of the observers, but even at such close range the inner wing-bar was not to be seen except when the wind ruffled the coverts.

Four hours after the bird had been released, a *Phylloscopus* warbler was located some distance away by most of those named above. The yellow rump, conspicuous superciliary and wing-bar, tiny size, greenish upper-parts and active behaviour convinced all concerned that it was a Pallas's Warbler, but whether or not it was the same bird could not be ascertained.

P. H. G. WOLSTENHOLME,
J. M. BUTTERWORTH and RALPH CHISLETT

[This constitutes the sixth British record of this Siberian species, and the fifth in a space of ten years. It should be remembered that one was identified in Essex only a week before the present observation (*Brit. Birds*, 54: 73-74).—EDS.]

Great Grey Shrike persistently chasing pipit.—In a recent note (*Brit. Birds*, 54: 163-164) Ralph Stokoe draws attention to the inference in *The Handbook* that Great Grey Shrikes (*Lanius excubitor*) normally capture small birds by a surprise swoop from a perch. I suggest, however, that a chase of one sort or another may be more usual.

On 9th August 1960, in an area of birch scrub on the Kiruna-Kareasuando road in northern Sweden, my attention was drawn to two birds fifty or sixty feet up in the air over my head. One was a pipit (*Anthus* sp.) and the other a Great Grey Shrike. The latter was closely pursuing the former and apparently endeavouring to attack it. Although the shrike was far faster in its movements, however, the pipit was able to make abrupt turns within a small compass. This continually caused the shrike to over-reach itself and perform a series of larger circles around the pipit. The smaller bird constantly uttered a long shrill note, but the shrike was silent. In spite of its apparently weak flight, the former was persistently able to avoid the other's rushes and this "hare and tortoise" type of chase, which may have begun some time before I noticed it, continued for two or three minutes until the shrike finally turned away and swooped down to perch on a vantage point.

C. J. O. HARRISON

White-throated Sparrow in Hampshire.—On 19th May 1961, at Needs Oar Point, near Beaulieu, Hampshire, I watched a bird which, from the field-description taken at the time, I was later able to identify as a White-throated Sparrow (*Zonotrichia albicollis*). It was perched prominently on a gorse bush and I watched it preening for about twenty minutes at 25 to 30 yards range before it dropped to the ground to feed. It then disappeared into a gorse thicket from which it did not subsequently emerge and from which it could not be flushed. In general appearance it strongly resembled a Dunnock (*Prunella modularis*), but with prominent black and white head stripes. The following is a summary of the description obtained:

Upper-parts: streak through centre of crown white, faintly tinged buff; black stripe from bill broadening out posteriorly and extending to hind crown; very broad superciliary, white (tinged grey) behind eye, lemon yellow in front of eye; a second black stripe through eye, slightly broader behind eye and broadening out on posterior ear-coverts; ear-coverts and sides of neck grey; mantle chestnut-brown with black stripes; back rich buff with black stripes; tail rich brown, slightly paler on outer edges of outer feathers, notched; wing-coverts chestnut, with buffish tips to lesser and greater coverts; primaries greyish-

brown. *Under-parts*: throat white, enclosed by a narrow black border, broader below; breast greyish; belly paler grey; flanks tinged buff. *Soft parts*: bill greyish-horn; legs buffish; eye dark.

It was no doubt due to the horizontal pose, the nervous actions (including wing-flicking) and the combination of soft grey under-parts and heavily striped chestnut-brown upper-parts that the bird had a Dunnock-like appearance. The crown was high in the front, and sloped back.

I had had a brief glimpse of a small Dunnock-like bird with prominent black and white head stripes at the same place a fortnight earlier, on 5th May, but could not find it on 10th May, when I next visited the area.

This constitutes only the second authenticated record of this North American species in Great Britain, the first being a male shot on the Flannan Isles on 18th May 1909 (*Brit. Birds*, 53: 97-98). It is also of note, however, that two White-throated Sparrows crossed the Atlantic from New York to Southampton on board ship in September-October 1957, last being seen within sight of the British Isles (*Brit. Birds*, 51: 358).

J. T. R. SHARROCK

Review

The Canvasback on a Prairie Marsh. By H. Albert Hochbaum. Stackpole Company, Harrisburg, U.S.A., 1959 (second edition). 207 pages; 18 photographs. \$4.50.

Originally published towards the end of the 1939-45 war, this was the first of a series of authoritative studies emanating from the Delta Waterfowl Research Station in Manitoba, Canada, where the author has been Director for many years. As a work of merit it won the Brewster Medal of the American Ornithologists' Union and the Literary Award of the Wildlife Society. For us in the British Isles, this second edition comes at a time when stirrings in the field of waterfowl conservation spotlight a need for a wider and up-to-date knowledge of our game ducks.

The story unfolds on the huge Delta Marsh bordering the southern shore of Lake Manitoba. Here, on an April morning, duck may be encountered in tens of thousands on marshes reaching beyond the horizon. While maintaining the thread of continuity in the Canvasback, a much sought after quarry of North American sportsman, Dr. Hochbaum writes intimately of the familiar Mallard, Shoveler and Pintail, as well as of such New World species as Blue-winged Teal, Redhead and Lesser Scaup. After detailing the arrival dates of seventeen species and the excess of males in the first flights of the three

diving ducks mentioned above, he follows with a very stimulating chapter on courtship. The courtship of all Delta ducks is divided into pre-nuptial competition, a period of non-display and, finally, the nuptial display of the mated pair; the last is closely related to territorial behaviour. Pre-nuptial courting parties and various display postures are sketched and described, and the functions of courtship fully discussed.

Approximately a quarter of the book concerns the nesting season of ten common species. As elsewhere, much original observation supports discussions on territory—its selection, components, defence and function—and other subjects covered in this part include utilisation of nesting cover; incubation periods; and the spans of the nesting periods. Another thirty pages are devoted to the brood season, with important data on the development of the young and the duration of the brood period. A section on the post-breeding season explains the delayed wing-moult of females and the post-breeding movements, habits and moulting grounds of many species. A final chapter on management is a recapitulation of important topics, the kind of things that anyone responsible for the welfare of wild ducks ought to be aware of. A fine coloured frontispiece of Canvasbacks in courtship flight and many delightful pen and ink sketches are by the author, who is unquestionably a waterfowl artist of the highest order. The tables and figures are particularly useful and a layout similar to one or two of the latter has already been adopted by other writers, including the reviewer.

So far, this review has touched only on what was written eighteen years ago, but an extremely important section of addenda (pages 183-188) briefly brings each chapter up-to-date. In some cases the results of these later studies supersede the author's own pioneer thinking and other concepts may need revision as the years roll by, but the lasting value of this impressive book lies in the helpful basic teaching it provides for professional and amateur waterfowl biologists and, indeed, for anyone interested in ducks.

I am confident that others will feel as I did some sixteen years ago when, on my reading this book for the first time, my own fragments of observation fell quickly into orderly pattern. Dr. Hochbaum bridged the gaps and by the time the epilogue was reached I felt a better duck man than I had been before.

E. H. GILLHAM

Correction. "Voice of the Whinchat": In a note on this subject in our August issue (page 328), reference was made to the first breeding record of the Whinchat (*Saxicola rubetra*) in Co. Westmeath. This should have been Co. Meath.

Notice to Contributors

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1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

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I. J. Ferguson-Lees and M. D. England

(with three plates)

An immature male Tufted Duck \times Pochard hybrid

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British Birds

Vol. 54 No. 10

OCTOBER 1961



The vocabulary of the Great Tit

By Terry Gompertz

(Plates 59-61)

INTRODUCTION

THE VOCABULARY of the Great Tit (*Parus major*) is notorious for its variety. Nicholson (1936) remarked that "a proper description of the Great Tit's language would almost require a book to itself, for no other British bird uses such a wide variety of different notes". *The Handbook of British Birds* refers to the need for an adequate analysis. No such analysis has yet been published, though Hinde (1952) discussed some calls and song.

Any serious study of a bird's vocabulary requires the use of recordings which can be made available to other workers, so that they are at least agreed on the exact call whose significance they may wish to question or discuss. The object of this paper, in which almost all the calls and songs discussed have been tape-recorded,* is to suggest a possible classification of the Great Tit vocabulary—one based chiefly on the types of behaviour with which certain elements in the vocabulary are associated.

This approach to the analysis of the vocabulary has naturally led me to consult the considerable literature relating to Passerine behaviour. However, for reasons of space and of the limitations of my study to date, I have included very few references. Much of the literature results from the detailed studies of professional ethologists into individual species and families, to which it seems useless to refer unless one is in a position to contribute something useful to the discussion of points of theoretical interest.

*Copies of recordings made during the present study will be deposited with the Library of Recorded Animal Sounds of the Committee for Biological Acoustics.



METHOD AND LOCALITIES OF STUDY

For the past four years, I have studied the Great Tit's voice and behaviour, using the following methods:

1. The vocabulary of known and colour-ringed birds, whose daily activities I have watched closely for lengthy periods, has been recorded.*

2. The hand-rearing and subsequent keeping of birds free-flying within a house and aviary. (In the case of one bird, it was entirely free-flying during the last weeks before its life was ended by an accident; this bird, a male, was paired to me and therefore followed me round the garden and on short walks.)

3. The vocabulary used by birds in areas in which it was not possible to record was transcribed in a notation devised by my friend Rosemary E. Jellis, who also made the musical analysis of the songs.† During field observations where recording was impracticable, and in the work of analysing the several hundred recordings, it was invaluable to have the continual help of a colleague concentrating exclusively on the nature of the sounds heard.

4. Certain of the calls recorded, and the entire song repertoire of two males, have been submitted to spectrographic analysis.

Of those birds whose vocabulary I recorded, one pair of adults nesting in the garden of a research institute at Hampstead, and two of their fledglings, were hand-tamed and performed most of their activities very close to me—in the case of the juveniles while actually perched on or hopping about on me. Another pair was recorded on a Yorkshire farm during one breeding season. The remainder of my recordings of wild-living tits have been made in a Middlesex garden of one-third of an acre, on the edge of a golf course which includes considerable stretches of mature oak woodland and thorn scrub. The garden itself includes a strip of mixed woodland fronting the house. Several of the neighbouring gardens (each including a strip of woodland) have been open to me for constant observation, thus providing opportunities for keeping track of the activities of seven pairs of Great Tits.

*Throughout this paper the use of the word "record" indicates an electric recording available as evidence of what sound the bird uttered.

†This system of notation had been devised before she knew of North's valuable paper on "Transcribing bird song" (1950). She is in firm agreement with him on the importance of standard musical notation combined with some form of phonetic indication, where appropriate, for the accurate transcription of songs and calls. Her own field notation, however, differs somewhat from his and omits the use of tonic sol-fa symbols.

At fledging time, some young of a number of local broods followed their parents to our garden and later spent a good part of the late June, July, August and September days in it. This enabled me to observe juvenile voice and behaviour more closely than is usually possible in the dense scrub at wood edges where so many tit youngsters often congregate. This close observation of comparatively tame but wild-living youngsters served as a necessary check on my observations of the hand-reared birds.

Continual observations were also made, and calls noted, in an area of approximately 75 acres which includes the golf course already referred to and some roughish pasture lands divided by thorn hedges and numerous well grown oak, ash and elm trees. Apart from the two localities mentioned above, field observations were made, and calls and songs transcribed, in a few other country areas, chiefly in Middlesex, north-east Scotland and Yorkshire.

CHARACTER OF THE GREAT TIT

It is hardly necessary to give any detailed description of the life and habits of so familiar a bird. But there are three aspects of its character, so clearly related to the large vocabulary it uses, that should be mentioned. The Great Tit is extremely active, very social and highly excitable. As Newton remarked in his *Dictionary of Birds*, "Few birds are more restless in disposition, and if 'irritability' is the test of high organisation, as one systematist asserts, the Paridae should stand very near the top of the list." This "irritability" of the *Parus* temperament is certainly one of the factors which must be taken into account when attempting to understand the significance of the variety of calls *Parus major* is capable of producing within a very short space of time. One cannot watch Great Tits for very long before realising that it is almost impossible for a member of the species—particularly a male—to remain silent for long. It goes about its daily round in a nearly continuous state of exclamation, sometimes delivered loud and clear, occasionally almost explosive, often *sotto voce*. Indeed, the silence in a house recently deprived of the presence of a resident Great Tit is almost intolerable.

CHARACTER OF VOICE AND VOCABULARY

(This section has been written jointly by the author and R. E. Jellis)

To the human ear, the chief characteristics of the Great Tit's voice and vocabulary, considered in musical terms, are: that the bird produces musical notes of a more or less definite pitch and duration; that it uses the most common elements in the diatonic scale, the full tone and the intervals of the major and minor thirds, fourths, fifths and octaves; and that with these simple melodic elements, individual birds build

up a considerable repertoire of songs and calls by changes of tempo and rhythm.

There are, however, other elements in the vocabulary which must be described as noises rather than musical sounds—these are, as it were, the ejaculated, as opposed to the sung, elements.

The distinction between the two types of sounds is clearly evident when one is trying to make a notation for the vocabulary. The musical sounds present no great problems; they can all be written in ordinary musical notation with the addition of a few signs to denote certain tone-qualities. For the non-musical sounds, however, one must devise a set of serviceable symbols chosen merely for ease and speed of writing.

While we have said above that many of the calls, and all the songs, are built from whole tones and the most common intervals of the diatonic scale, we do not wish to imply that a given call or song is always immediately recognisable as, say, a phrase consisting of major thirds or the common chord. As with our own musical phrases when played at a very high speed, the shape of the phrase and an impression of the intervals used are immediately apparent; but it is sometimes necessary to play it more slowly to make an accurate analysis of the rhythm, tempo and intervals. This is a problem in which the use of the tape-recorder is invaluable. One can play the phrase at half the speed at which it was recorded, thus getting an exact notation. (By halving the playing speed, of course, the phrase is heard an octave lower—making it easier to check the exact pitch by reference to a piano or wind instrument.)

ANALYSIS OF THE VOCABULARY

Method

In analysing a complex vocabulary, one fruitful method is to follow the course of its development from the juvenile stage onward. Valuable clues to the significance of certain calls, or groups of calls, may be found by discovering whether they are present or absent in the vocabulary of juveniles and of mature birds of both sexes throughout the behaviour cycle or at any given point in it.

A. Begging notes

During most of its time as a nestling and throughout the period after fledging when following its parents for food, the young Great Tit utters begging cries which have been rendered as *tsee-tsee-tsee-tsee-tsee* (*The Handbook*) and *zicker-zicker-zicker-zid* or *zi-zi-zi-zi-zi-zi-zi-zi* (Hinde 1952*). Unlike Hinde, I find the begging notes of the Great

*This particular work is referred to regularly from now on and, for ease of reading, the conventional repetition of the year or "*op. cit.*" has been discarded; all references to Hinde in the remainder of this paper are to his 1952 publication.

Tit completely different from those of the Blue Tit (*P. caeruleus*). The pitch variation of the Blue is nearly always such as to end in one or more falling notes whereas the Great Tit almost invariably rises. This is a useful difference when one is trying to locate tit broods in a wood.

The begging calls of different broods of Great Tits are often dissimilar in tone-quality, as are the voices of their respective parents, and individuals among broods vary in pitch. (I have some evidence which suggests that the pitch variation might be indicative of the sex of the nestling, the higher voices in one brood being those of the males and the lower those of the females.)

The proximity of the parent and the competing cries of other youngsters both serve to make the begging cries more intense and to rise more sharply in pitch. As with so many other species, the begging cries are accompanied by wing shivering.

B. Contact note

As soon as the young tit fledges, it makes a call which I used to consider was merely a different version of the begging notes—usually three rather reedy notes of the same pitch. But closer observation of the circumstances in which it is made has convinced me that it should be regarded as the first stage in the development of the adult call note *pee* (see under). Characteristically, the youngster utters a group of three of these notes when temporarily isolated from its parents or companions. When watching a brood emerge from their nest site, one hears first one and then another utter these rather plaintive notes after making their first and often rather uncertain landings. And when a party of fledglings is on the move with its parents one can always tell when one member has got left behind—and its location—from these notes delivered by the isolated youngster.

The following instance may serve to point the difference between begging notes and this call. I happened to be in another room when one of a pair of nestlings I was hand-rearing fledged from their nest box. It was these notes, uttered by the fledged youngster, that brought me to the room to find it perched on a chair. On my approach it changed to begging: contact had been re-established with its adopted parent.

C. Juvenile "warble"

The next stage in the development of the young Great Tit's voice is both interesting and exciting to hear. As it begins to be slightly independent of its parents—a stage which occurs between seven and fourteen days after leaving the nest—there are changes in voice to accompany the changes in behaviour.

The young bird is mastering its environment to some degree, finding a number of caterpillars and insects for itself, hanging upside down quite competently in the process. Along with one or more members of the brood, it is now more liable to be left for some time in the "nursery" thickets where young tits are taken, until one or both parents return from a private foraging expedition or "quiet time" and collect the brood together again to move on elsewhere. It is during these stationary spells that one first hears the beginnings of a most attractive warbling utterance. As the parent flies away the youngster has probably been begging at intensity and it may continue a little, interrupting itself to peck at a leaf or twig. Then it gives the first one or two notes of begging and finds itself uttering another note, higher in pitch; the effect is somewhat similar to the breaking of a boy's voice at puberty—except that the "cracking" results in a higher note and not a lower. Having hit this note, the young tit goes off into a little *glissando* passage. This appears to intrigue it and the process is repeated. From now on, the youngster does more and more of this free "warbling", shaping the passages, as it were, more to its own satisfaction.

This random, experimental use of the voice appears to be associated with all kinds of exploratory activity, such as examining holes and cracks, tapping at different kinds of surfaces, pulling at leaves or chasing humble bees. It also occurs between little bouts of preening or when the bird is sitting still. I have never heard it from a youngster who appeared to be food-searching in earnest.

For example, a youngster, about three and a half weeks fledged, used constantly to take cheese and nuts from a little basket attached to a pergola. When it wanted to feed, it merely went straight in and out of the small entrance hole. Then, if it made any sound at all, it would merely utter two or three begging notes. But at other times, whether or not there was still food in the basket, it would play about, tapping the closed end of the basket from outside, pecking at the gaps in the basket-work, or going in and tapping about inside, peering out from time to time, and so on. This behaviour, very engaging to watch, was accompanied by little bursts of warble.

Since the warbling passages are *pianissimo*, often carrying only for a distance of three yards or so, they would be difficult to hear from a bird in, say, a bramble thicket, unless one were already "tuned in" to the sound. Without watching hundreds of broods in garden and woodland conditions, it would be difficult to prove the point, but I imagine that since it is entirely a leisure activity the amount any one youngster will "warble" will depend on how easily it is getting its food and on its general sense of well being. My own hand-reared birds "warbled" a great deal; so did the pair of hand-tamed youngsters in the Hamp-

stead garden and the youngsters around my present garden, both places where the food supply is liberally topped up by human offerings.

The juvenile "warbling" is heard from youngsters of both sexes. But comparing the recordings from my hand-reared birds (whose sex was, of course, subsequently known) and from listening to the garden and woodland birds (where there was, however, no subsequent check on sex) I believe that there may be a difference in the "warbling" of young males and females. Briefly, this could be described as giving the aural impression of having a more definite pattern and a greater range of musical material in the case of young males.

During "warbling" the bill is normally closed, or nearly so, as it is in the adult "whispered quiet song" (see section D). When it reaches peaks of intensity, however, the bill is slightly opened and the wings may be shivered.

I have heard a very similar "warbling" from many young Blue Tits—and recorded it from a hand-reared Blue Tit—and also heard it from young Coal Tits (*P. ater*). The circumstances in which it was delivered were similar to those mentioned above.

This "warbling" of young tits is much stimulated by other sounds; all those I have watched have shown the most intense interest in any sounds with high frequency components. Indeed, I could almost guarantee to get my hand-reared birds warbling at the first hearing of any complex, high-pitched noise; trilled passages in the highest register of the piano, the higher woodwind acrobatics in orchestral music, the continual "squinking" of recording tape running on a metal spool, or rain falling hard on a slate roof; also the noise of an ancient geyser and the sizzling of frying bacon. Apart from rain on a roof, these noises are not usually heard by young birds in the wild, but those anywhere in earshot of the mechanical din of modern civilisation are certainly affected by the high frequency components of the devastating noises we have come to accept as inevitable. The hand-tamed juveniles in the Hampstead garden were sent into frenzies of warbling by the whine of a circular saw and the second of my hand-reared birds, when in his aviary, was fascinated by the sound of a peculiarly vicious electric hedge-cutter operating nearby. The songs of other birds such as the Willow Warbler (*Phylloscopus trochilus*), the Wren (*Troglodytes troglodytes*) and the Robin (*Erithacus rubecula*) also appear to be a stimulus, though the young tits I heard in the wild did not appear to try and mimic the songs—or else they were not very good mimics. My hand-reared male, after the moult, could produce passable Robin imitations, but our resident male Robin was far better at mocking the tit.

D. "Quiet song", "whispered" and "intense"

Apart from the random warbling of juveniles, there are two other types

of "quiet song" in the Great Tit vocabulary, normally delivered when the bird is alone. (I use the term "quiet song" merely to imply that these utterances are soft and of a generally musical nature; not that they in any way resemble true song.)

The first, which I call "whispered song", is very similar to the random warble of juveniles and I have heard it from both males and females, though more frequently from the former. The female version is more squeaky in tone-quality, more *glissando* and less mellifluous than the male.

"Whispered song" is only audible at a few yards—a maximum of ten in very quiet conditions. I have heard it most often on mild days from February to the start of breeding, and again during the time after the young have fledged until the moult. Typically, this "whispered song", like the juvenile warble, always occurs in periods of relaxation and is delivered in cover.

Since quiet song of this kind is only audible at close range, it would be rash to infer that it is absent from the vocabulary at any time of year just because one had not heard it. But common sense would suggest that, since it appears to be connected with a relaxed state of well-being, the seasons during which the bird will indulge in "whispered song" will be those when food-finding is easy and other stresses are absent.

The second type of quiet song is an utterance which I call the "intense", because of its character and the manner in which it is delivered. It consists of phrases of high-pitched notes, ranging over a fifth or more, heavily stressed and glided into one another. A succession of phrases may continue for as long as thirty seconds without a pause and the whole utterance may go on for several minutes. During it, the bird—though, as far as I have been able to judge, invariably alone—appears to be in a condition of considerable excitement, the wings being shivered rapidly, the stance crouching, the head somewhat bowed and the mandibles slightly parted: all features strikingly similar to the courtship feeding and pre-copulatory display, in which, however, the vocal utterance is different (see section R3).

I have not heard "intense" quiet song from a known female. Of my hand-reared birds, it was only the male who used it, starting in the latter stage of his juvenile days. I have heard it from a few juveniles in the wild, shortly before the moult, but have not known their sex. The one wild juvenile whose behaviour at the relevant period I was able to watch closely was in an extremely aggressive state, threatening and attacking both adults and other juveniles.

In the case of adult males, the circumstances, when known, were: (a) frequently from unmated males, apparently in search of a mate, most often from February onwards; (b) occasionally from mated

birds at the start of the breeding season; and (c) frequently from mated birds towards the end of the breeding season and towards the end of and immediately after the moult. However, since this type of quiet song is also only audible at a few yards, one would need a far longer period of study to be sure of the exact circumstances in which it is delivered. From my observations so far, I suggest that it is associated with a degree of sexual excitement which has no other outlet.

I do not feel in a position to judge whether either of these two types of quiet song can be regarded as sub-song, for the exact definition of the nature and significance of sub-song remains a matter requiring, as Thorpe (1956) and Thorpe and Pilcher (1958) have emphasised, a great deal more research. I have therefore merely given each type a provisional name which, I hope, will help field ornithologists and others interested to recognise the respective utterances.

E. "Hawk" alarm call

The "hawk" alarm call, described by Hinde as a high-pitched and trilling *tsee-ee-ee-ee*, is given by all Great Tits in response to a possible predator flying overhead. My hand-reared nestlings uttered it if one inadvertently flicked a piece of material over them. Newly fledged youngsters use the call whether or not their parents are present. The *tsee-ee-ee-ee* call, as Hinde states, is not only given in response to the sight of a tit predator; any largish bird flying overhead, such as a pigeon or a gull, may evoke the *tsee-ee-ee-ee* and its accompanying behaviour: either the tit flies into cover or it remains in the same place—in both instances crouching with head retracted into the shoulders, crest flattened and bill pointed upwards. My hand-reared birds gave the *tsee-ee-ee-ee* call at the sight of aeroplanes and I have heard wild youngsters and adults apparently do so, but with birds in the wild it is, of course, much more difficult to be sure that the aeroplane is the stimulus.

F. Churring

Before it is independent of its parents, the young tit develops the churring notes written as *chich-ich-ich-ich-ich* in *The Handbook*. The churring utterances of juveniles when they are fully independent, and of adult males and females, are extremely varied—chiefly by differing prefixes and the tone-quality and duration of the churring itself. The variations are so many as to make classification difficult, but there are at least six varieties comparatively easy to distinguish, each associated with different situations and forms of behaviour.

1. The true "alarm" and "scold" churring is always used at the approach of possible ground predators, such as cats and dogs, and at

perched Tawny Owls (*Strix aluco*), Cuckoos (*Cuculus canorus*), Magpies (*Pica pica*) and Jays (*Garrulus glandarius*). It is often preceded by a series of "pits" and "chits" or similar sounds with a noise component; thereafter each churr is prefixed by these sounds. But as these utterances grow more intense, the prefix is often dropped and the churring becomes extremely rough in tone-quality and prolonged in duration. If there are a number of tits scattered through a garden, one can follow the route of a prowling cat by the unprefixd throaty churrings of the tits near whom it is passing. As on all occasions which cause anger and alarm, the crest is erected during this type of churring. Both members of a breeding pair, particularly the male, will use it at a human being, even one they are unafraid of in other situations, when he or she comes near the nest or newly-fledged brood. Nestlings and newly fledged birds are silenced by scold-churring. My observations indicate that young birds appear to learn from older birds to churr at cats and humans.

A brood of fledglings, visiting the garden with their parents, ignored my close approach for a period of three to four days. Meanwhile their parents were churring away. At the end of that time, the youngsters greeted my approach by churring. Similarly, a hand-reared bird sat, watchful but silent, in the outside aviary while a cat prowled by. Meanwhile, the outside tits were churring. This happened—to my knowledge—two or three times on three successive days. By the fourth day the youngster was churring away at the cat. The young tit begins by a rough unpractised churring and then adds the prefixes.

2. The second variety of churring is used in several types of situation—all of which may be characterised as "exciting", "tricky", "annoying" or "frustrating". Though it can be somewhat similar to the mildest form of "scold" churring, the notes are not very long in duration, nor rough in quality; they may be prefixed by *tsee*, *pee* or *pit* or *chit*, but these are never delivered with any great intensity. A typical situation in which this type of churring is used is when a Great Tit falls from too light a twig while imitating Blue Tit acrobatics on, say, a silver birch. It is this variant of churring (without prefix) which is usually the first heard from a hand-reared bird and often from wild fledglings; characteristically when they make their first clumsy attempts at hanging upside down or find themselves hanging upside down and just succeed in not falling off. The same variety of churring is also used by adults when an accustomed food supply is not forthcoming; my garden birds will churr in this way if the kitchen windows are closed so that they cannot get at the jar of nuts kept for them on the inside sill. Males and females use this variety when foraging and investigating nesting and roosting holes. Both sexes use it at the

young towards the end of the fledgling period when the youngsters are still pursuing them relentlessly for food. And a male leading the brood to roost will churr in this way at the "zickering" youngsters who keep holding up proceedings.

3. The third variety of churring has a different type of prefix, almost impossible to translate except as a "squawk". (The squawk is used by itself also and always appears to indicate a mixture of fear and aggression. It is accompanied by the wings-raised threat posture.) The squawk-churring is heard a lot from young birds when, towards the end of the fledgling period, they start to chase each other away from food and favourite perches and begin to use the wings-raised threat posture in so doing. I have heard squawk-churring from adult females apparently resenting the too close approach of their mates. I have never heard it or the squawk from an adult male.

4. The fourth variety of churring is used between paired adults, notably when one is thwarted of the company of the other. Two or three short, separated churring notes are prefixed by two *pee* notes. Of all the varieties used, this is the easiest churring utterance (to human ears) to distinguish as uttered by a given individual. When my hand-reared male followed me round the garden I usually knew where he was by his "pee-churrs", even when two other males and females were "pee-churring" at the same time. Males use this "pee-churring" (among other calls) when apparently trying to entice the female out of the nest-hole after she has settled in for the night (or the roost-hole in winter) or when they themselves are refused entrance.

5. The fifth variety of churring is usually prefixed by "pits", "chits" or "spicks", or occasionally, in the case of males, by "tinks". The churring is often a lengthy roll (but it differs greatly in length), much lighter in tone-quality than scolding-churring and higher in pitch. It is used during reproductive fighting by both males and females.*

6. "Chatter-churring" is a light (in tone-quality) and stylised version of scolding-churring. It sounds rather like a miniature version of a Magpie's *chatchatchatchatchack* (this is by no means the only time when Great Tits succeed in convincing one of corvine affinities!). Chatter-churring is used by both males and females and, when I have known the circumstances, the individuals were always paired and usually appeared to have lost contact with their mates. However, I

*Following the suggestion of Hinde, I use the term "reproductive fighting" to denote fighting which "serves to secure objects or situations which are indispensable for reproduction"—i.e. the term covers fighting in which the defence of, or the acquisition of, territory or a mate are involved. Normally, reproductive fighting in Great Tits is intra-specific but it may be inter-specific (with other Paridae) in cases of skirmishes over nest sites.

have heard it when the pair have been together and on these occasions it has followed a skirmish with intruders into the territory.

Although I have tried to indicate the characteristic situations in which the various churring utterances are heard, it is important to stress the fact that an individual passes very easily from one to another variety. Thus, within a few minutes one might hear a male awaiting the emergence of his mate from the nest site first thing in the morning use the first, second, fourth and fifth varieties of those I have listed. If one was in a position to see all that was going on one would realise that the bird had scolded at a passing Grey Squirrel (*Sciurus carolinensis*), discovered that a favourite perch had been blown down overnight, failed to entice the female from the nest site, and seen off an intruding Great Tit.

G. *Non-musical sounds*

Various of the non-musical sounds already mentioned are to be heard from juveniles about the same time as warbling starts. The sounds are extremely difficult to transcribe; for convenience, and to give some idea of the sound quality, I render four of them as *pit*, *chit*, *spick* and *squink* (a spectrogram of a call in which *spick* is one of the elements is shown in plate 61b). These sounds, and some others very similar in character, are heard most commonly when juveniles, and adult males and females, are foraging, or during intra- and inter-specific fighting. One can only say that, used by themselves, they appear to be a series of ejaculations uttered by the bird with different degrees of intensity dependent both on its own internal state and the external circumstances. They form, as it were, a running commentary on the activity it is conducting, whether it be food searching, hole examining, bathing or fighting. Except when combined with other musical notes, or with churring, they are audible only at close range.

The non-musical sounds include the "distress" or "injury" call or shriek—very similar to that of some other species of small Passerines. The only occasions on which I have heard it were once when I accidentally injured one of my hand-reared birds, and occasionally during fighting among wild birds, when one has apparently been hurt.

One non-musical sound which will be familiar to those who have had occasion to make close observations of nesting behaviour is the explosive hiss mentioned in *The Handbook* as used by an incubating bird disturbed on the nest. The hiss is undoubtedly an indication of agitation. Hinde describes a very elaborate display made by a male Great Tit at a Grey Squirrel in its drey, during which the bird hissed continuously. I have heard the hiss preceding the *tsec-ce-ce-ee* alarm call, given by birds disturbed at their roosts and preceding the scold-churring. In all cases there appears to be an element of surprise

inducing the agitation. On the nest or at roost the hiss is often accompanied by wing-flaps.

II. *Tsee, pee, tink*

1. At the same time as the young Great Tit begins to lead an independent existence—foraging on its own account—it also begins to utter the adult notes *tsee* (*The Handbook*) and *pee*. The *tsee* is dulcet and high-pitched, the notes being delivered in a rapid sequence. The *pee* notes are subject to great variation within the vocabulary of one individual, but I use the rendering for all varieties since one cannot devise verbal renderings which would represent the variations that are distinguishable by ear, can be transcribed in musical notation and are indicated by spectrographic analysis. In contrast to the *tsee* note, with which they are often combined, *pee* notes may vary in pitch but are more commonly about an octave lower when used as a succession of single notes. Their characteristic quality I have tried to convey in the rendering *pee*, the labial consonant combined with “ee” suggesting the open, carrying sound typical of the notes. From the same bird some *pee* notes are very dulcet, others are louder and coarser, and others still are noticeably short in duration and staccato. (See plate 59 for spectrograms of *tsee*, a dulcet *pee* and the loudest form of *pee*.)

Among adults, some of the male variants of the *pee* notes can carry over considerable distances (150 yards in favourable acoustic conditions), though none has the ringing quality of *tink* (see below); the female versions, like those of juveniles, are usually softer.

When used simply as a succession of notes, as opposed to a call in which the notes are grouped in a definite and repeated pattern of pitch and rhythm, the *pee* notes are usually of approximately equal duration, evenly spaced in time and more or less level in pitch.

2. *Tsee* and the various *pee* notes are used in many calls, which may be most usefully divided into:

GROUP A. With one exception, those which are composed solely of *tsee* or the *pee* variants. These calls are all associated with situations in which there is no obvious aggressive or self-assertive display and are heard from juveniles (after independence) and adults of both sexes. In these calls the notes are varied in pitch and may be unequal in duration and unevenly spaced in time. Four common calls are:

(i) Two notes of approximately equal duration and emphasis, but with the second note lower in pitch than the first. The musical intervals most commonly used are the major or minor thirds, or a fourth, but some birds favour fifths.

(ii) Three notes, of which the first two are as in (i) and the third is of the same pitch as the first.

(iii) Three notes, of which the first two are of the same pitch and duration and the third higher in pitch, the intervals as in (i), and longer in duration (see plate 59d for a spectrogram of this call).

(iv) The exception mentioned above, in which three or more *pee* notes are prefixed by two or more of the non-musical *spick* sounds.

GROUP B. Calls in which *tsee* and the *pee* variants appear combined with notes of a strongly contrasted tone-quality and in which the associated behaviour seems always to have an aggressive or assertive element. This group is almost exclusive to adult males and is discussed in section I.

3. *Tsee*, the *pee* note variants and the calls described in group A above are almost always associated with movement, being used either immediately before or during flight. They are heard from birds on the move, either singly or in groups, and from paired birds keeping in contact with each other. Particularly during the autumn and early winter, these notes and calls will stimulate an individual to fly in the direction of others who are calling. My hand-reared tits would normally be roused into flying round the house and calling *pee* when hearing the *pee* notes of others passing through the garden. But it is important to note that the hand-reared birds also showed a strong internal rhythm as to times of "fly around" and *pee* calling. Quite regardless of whether other Great Tits were around outside or not, the house-living birds had certain times of day when the *pee* notes and calls accompanied much flying to and fro. Similarly, the colour-ringed birds I have had under close observation have also shown this internal rhythm which varies between individuals and in individuals over a period of several days. Thus, although there may be in general a considerable amount of calling about fifteen minutes after emerging from the roost on an autumn morning (usually a peak time), or in the half hour before roosting (another peak time), one notices that certain individuals may call very little on two or three successive days and then for a period of, say, six to ten days be very vocal.

4. Until the moult, I have heard no young bird give the true *tink* note (Hinde renders this as *twink*). This is the note described in *The Handbook* as a ringing Chaffinch-like *tink-tink-tink*. I find this a somewhat misleading description as, to my mind, what helps one to distinguish the two calls is the ringing or echo-like quality of the Great Tit call as opposed to the thicker sounding one of the Chaffinch (*Fringilla coelebs*), which is markedly lacking in echo. The Chaffinch *chink* is most liable to be taken as the Great Tit *tink* when the social version of the former (Marler 1956) is heard close to a house or in other acoustic conditions which favour echo.

Hinde speaks of gradations between *tsee* and *tink* notes and 1

think this may account for the fact that I find myself in disagreement with him over the circumstances in which the *tink* notes are used. (See plate 59 in which a spectrogram of *tink* appears with those of *tsee*, a dulcet *pee* and the loudest form of *pee*, to illustrate the difference between all these notes.) Whereas Hinde found the *tink* call so commonly associated with flocking movements as to use it as an index of the frequency of calling during the day, and in different months, I have found that *tink*, as opposed to *tsee* and the various clearly distinguishable *pee* variants, is used almost exclusively by adult males.

Heinroth (1924-26) noted that a hand-reared female, kept for a full year, did not use either *tink* or what he described as the spring-call "*zi:ibe*" and wrote: "It would be important to find out how far these notes are perhaps confined to male birds". I should add that I did not know of this observation until my own studies had already led me to conclude that *tink* was almost exclusively a male utterance and closely related to song.

Whereas *tsee*, the various *pee* notes and the calls derived from them have the effect of maintaining contact between Great Tits, the *tink* note has precisely the opposite effect. It is heard when Great Tits are moving through a garden or wood. But the birds it is heard from are those who are either returning to or already within their own territory or preferred area, or those who are trying to establish themselves within an area. In fact, *tink* is a call which indicates an assertive or aggressive attitude on the part of the bird making it; or so one would suppose from the various circumstances in which I have recorded it and noted the accompanying behaviour: (a) from males who are attempting to or who have established themselves in a preferred area or territory; (b) from males when they leave their roost holes in the morning and are in process of their "first thing in the morning" survey of their immediate surroundings; (c) from males when they re-enter their territories at different times during the day; (d) from males when they re-enter their territories at roosting time; (e) from males engaged in territorial disputes and boundary displays; (f) from males as a prelude to singing or when other males are singing.

It is easiest to show the place of *tink* in the behaviour cycle by a hypothetical but typical case history of a male at least two years old. The bird will hardly use *tink* at all during the moult. If, following the moult, he spends some time on his territory he is likely to start "tinking" particularly if there are wandering young males around. If he has a fairly considerable recrudescence of song during the early autumn months the amount of "tinking" will be less than if he sings little. When he comes again into full song (which may be any time from mid-November to mid-January) there will be less "tinking". If he has to undertake a considerable amount of territorial fighting (most likely

from the end of January to mid-March), he will have long "tinking" duels with his opponents; these duels will take place near to or on disputed boundaries and, where ground is ceded, the victor will sing. Once nesting activities are under way the bird will "tink" very much less, though during the course of nest building and incubation there may be outbursts of "tinking" during the first and last half hours of the day which he spends very close to the nest hole. Generally speaking, the more he sings at these times, the less he "tinks". Once he is engaged on the arduous business of getting food for the nestlings there is little or no "tinking" and very little song. This period, which is more or less simultaneous for a whole population, is one when territorial boundaries are generally ignored. "Tinking" and song are heard very little during the three weeks or so after the brood fledges (unless a second brood is undertaken) or from that time until the moult.

In the case of a first-year male—that is one who has just completed his first moult—*tink* enters his vocabulary while he is trying to establish himself within an area. I had a very clear picture of this from my hand-reared male. After the moult, this bird, which I aimed to free completely in the following spring and hoped would remain based on the house, was introduced by stages to each of its rooms. He started by "tinking" in the outside aviary, my library and the kitchen, the three places which had made up his world since he was a fledgling. At the same time as the "tinking" started, he also started aggressive displays at the males outside. It took him three or four days to master the required route—through the hall—from my library to the kitchen. Hitherto he had made the journey perched on my finger. As soon as this route was mastered he would "tink" from various vantage points in the hall, such as the coat rack or letter box. The ownership of each of the other rooms to which he found his way was similarly marked by outbursts of "tinking" and aggressive displays at males outside. When he first came into song—in November—he sang from various vantage points in all the rooms. When he became completely free flying, his first excursions into our garden, and neighbouring ones, were all marked by "tinking". He was, of course, trespassing into strongly held territories and was, at first, often forced to retreat into the house or his aviary. Here he would sing. Gradually, a *modus vivendi* was established by which the two outside males concerned ceded him the area immediately surrounding the house. Within this area he would sing.

Another example serves to show the relationship between "tinking", song and the internal state of the bird. Having discovered that a male, holding the territory which included the woodland in front of our house, took notice of recordings played by the open window, I

tried him out with several of his own and neighbouring songs and calls in order to observe his reactions. He would respond to recorded "tinks" (his own and other males') with song *if*, and *for as long as*, his threshold of song was low. Conversely, if one persisted long enough when playing him songs, he would eventually respond to song by "tinks".

From many observations of this kind, I suggest that "tinking" occurs when the bird is inhibited from song, and that this inhibition can result not only from external circumstances but from the internal state of the bird.

5. Although *tink* is not a normal constituent of the female vocabulary, it is occasionally heard from females. The circumstances in which I have heard it are:

(a) during unusually fierce reproductive fighting;

(b) when the female has been close to the chosen nest site shortly before or during the time of breeding; this is the one place in the territory with whose defence she is as actively concerned as the male and which, indeed, her mate may only enter at this time "by her permission";

(c) on one occasion only, from a female whose mate was in poor condition for three weeks or so in February and who was continually engaged in defending the territory against intruders; this female also sang during the same period, but neither "tinking" nor song were used any longer when her mate returned to normal condition three weeks or so later.

Generally speaking, it is the male who plays by far the greater part in defending, extending and proclaiming the territorial boundaries and it would seem biologically economical for the female not to waste energy on "tinking" and song if the territory is adequately defended by the male. In fact, the dissimilarity between the whole pattern of behaviour of the male and female during the late autumn and winter months is very noticeable and one facet of the difference is evidenced by comparing the vocabulary of the two. From at least early November onwards one is struck by the apparent abundance of energy shown by the male; he is forever rampaging about the place and it is at this season that one hears so many of the aggressive type of calls already mentioned and discussed in more detail below. The female confines her calling to *tsee*, *pee* notes and the other contact phrases derived from them. It is sometimes quite easy to overlook the presence of a female for several minutes until one has learnt by experience that she is most probably either engaged in a steady search for food or merely just sitting around; she appears to be much more occupied than is the male with "stoking up" and conserving her energies.

6. It is important to emphasise that the behaviour cycle of Great

Tits probably varies considerably in differing habitats. For instance, in the area where my most intensive observations have been made there has been little flocking by resident birds in the autumn and winter months. Those that are at least in their second year have all evinced territorial behaviour from shortly after the moult and have also spent much time in company with their mates. On the other hand, Hinde, the greater part of whose observations were made in an area of mixed woodland (one without houses and gardens), found a considerable amount of winter flocking, though the size of flocks varied in different years according to the presence or absence of locally abundant food supplies. During the period of winter flocking, Hinde found that it was difficult to tell if birds were paired or not and territorial behaviour only started when the winter flocks separated out. Comparing Hinde's findings on these points with my own, it seems obvious that, as between a population in which flocking occurs and one in which it does not, there is a noticeable difference in behaviour. And, of course, the difference in behaviour will be reflected in the calls which are heard. During those instances of flocking which I have had the opportunity to observe, I have only heard *tsee*, the *pee* notes and calls, churring and the various non-musical sounds associated with food-getting and fighting over food.

I. Calls combining tsee, pee, tink and other notes

There are three groups of calls, easily distinguished by ear, all of which fall, as far as the associated behaviour is concerned, into the second of the categories into which the *tsee* and *pee* note calls can be divided. All three groups are virtually exclusive to adult males.

1. Most of this group combine the *tsee* or *pee* and *tink* elements. One may hear *pee-tink-tink*, *pee-tink-pee-tink*, *tink-pee-tink* or other such combinations. Typically, these calls are used by males in situations very similar to those in which song or straightforward *tink* is heard. They enter—or re-enter—the vocabulary at the same time as *tink*. Many males use their own particular variants, of which they may have a number, after a prolonged burst of singing close to roosting time. Or a male may use them, between bursts of song, when waiting outside the nest site before the female emerges. In fact, they appear to indicate (as does *tink*) that the bird is, for some reason, inhibited from song. As with *tink*, “pee-tinking” is occasionally heard from females. In this group, also, are some other calls, used in exactly similar situations preceding or succeeding the *pee-tink* variants or song, in which the *pee* element is combined with one or more notes of a different tone-quality from either *pee* or *tink*.

2. Spectrograms of two examples of this group are shown in plate 61 (a and b). Both show the *pee* element combined with other musical

notes of a different tone quality and with sounds having strong noise components. It is these noise components which give the calls a very characteristic explosive effect. Onomatopoeic renderings* are: for (a) *chack-chack-ee*, *chack-chack-ee*; and for (b) *spick-spick-pee-peu-peu*. These calls are sometimes zipped off in groups of as many as fifteen or so. They are always associated with situations encountered in the establishment or defence of territory. Unlike those in the group discussed above, they are not used in circumstances where one can regard them as a sub-dominant form of song. Thus, they are rarely heard after the time when the territories in any given locality have been firmly established. When one does hear them after, say, mid-March, it usually indicates that wandering males are attempting to invade an occupied territory. They are most frequently heard when males are seeking to establish themselves during the autumn and also during the fierce territorial skirmishes in the early spring. As in the case of the *pee-tink* calls discussed above, an individual male may have three or four variants in his vocabulary.

3. Aurally, the calls in this group are composed of very vibrant *pee*-like notes which are always widely separated in pitch. Spectrograms of two examples are shown in plate 61 (c and d). These happen to be from the vocabulary of two different individuals, but each had both in his repertoire. Onomatopoeic renderings are: for (c) *i-yah-i-yah*; and for (d) *pee-hi-pee-hi*. Typically, these vibrant calls are used during reproductive fighting and also when the male has lost contact with the female. But the latter circumstance does not seem to stimulate a male to use them if reproductive skirmishing is at an end. I suspect, therefore, that this group of calls is particularly associated with territorial rivalry where possession of the female is under threat. When I have been sure of the circumstances, the intruding male has been unmated. If I am correct, then it explains the fact that these calls are used, along with other calls exclusively associated with absence of the female, when a male subject to pressure from unmated males has lost contact with his mate. In human terms, the mood of the male could be described as partly one of "angry suspicion".

J. "Muttered threat" phrase

In the vocabulary of adult males, there is one "muttered" phrase which, because of the nature of the utterance and its association with one particular aspect of behaviour, forces one to give it a category to itself. This is a phrase of three notes, which begins and ends on the same pitch, with the middle note lower. As with song and the *pee*

*These follow the recommendations for phonetic renderings given in *The Handbook*, except that italics are used throughout in accordance with the policy of this journal.

group calls, the interval may vary between individuals, but the pattern of the phrase is always the same, with the lower note heavily stressed. It is a very sibilant utterance, the sound being similar to a human's whistling between the teeth. Though it is only audible from a few feet, those whose bird tables are near to the window may have heard it from Great Tit males giving threat displays, either at members of their own or other *Parus* species. If one is close enough, or listening over a microphone, it is also to be heard during reproductive fighting, between rounds. One sometimes hears an apparently solitary male uttering these phrases; but, in the many instances where I have known the circumstances, this has always preceded or followed an aggressive encounter, or been delivered by an individual arriving at a place where he is used to encountering a territorial rival. In such instances one is irresistibly reminded of the muttered imprecations of humans in the condition known as "spoiling for a fight".

K. *Song: introductory remarks*

The basic phrases of the more stereotyped songs of the Great Tit are rendered by *The Handbook* as "teechū-teechū-teechū" and "teechūwee-teechūwee . . .". *The Handbook* and Hinde also state that a number of variants, some of them more elaborate, may be used by the same individual. The elements of variation are described and discussed below.

Normally, song is confined to the vocabulary of males who have completed their first moult. Hinde states that song may be heard from juvenile birds in late summer; but I have not heard it from any

PLATE 59 (*opposite*). Four sound-spectrograms of recordings made from the same individual male Great Tit (*Parus major*), by the same mechanical means and in approximately similar acoustic conditions.

- (a) shows three *tsee* notes followed by two dulcet *pee* notes. The *tsee* notes start at a frequency almost a full octave above the *pee* notes and glide downwards over a wide range of frequencies. The *pee* notes still show a downward curve, but over a much narrower range of frequencies. Thus, aurally, they are more easily assigned to a definite pitch.
- (b) shows loud *pee* notes—an aurally distinguishable gradation between the *pee* notes in (a) and the notes shown in (c).
- (c) *tink* notes. It will be seen that *tsee*, the dulcet *pee* and the loud *pee* all show a downward slope of differing gradients in contrast with the more or less level base line of *tink*.
- (d) shows one of the four common social calls described on page 382. Here, two of the loud *pee* notes shown in (b) are combined with yet another *pee* note variant which is higher in pitch and longer in duration.

The original spectrograms have a frequency scale from 0 to 10 kilocycles per second. However, all the Great Tit calls and songs shown here are of frequencies above 2 kilocycles per second, so for convenience of reproduction the lower part of the spectrogram has been omitted in each case and the scale, which, as will be seen, is logarithmic, starts at 1 kilocycle per second.

The vertical scale is the frequency in kilocycles per second, the horizontal the time in seconds

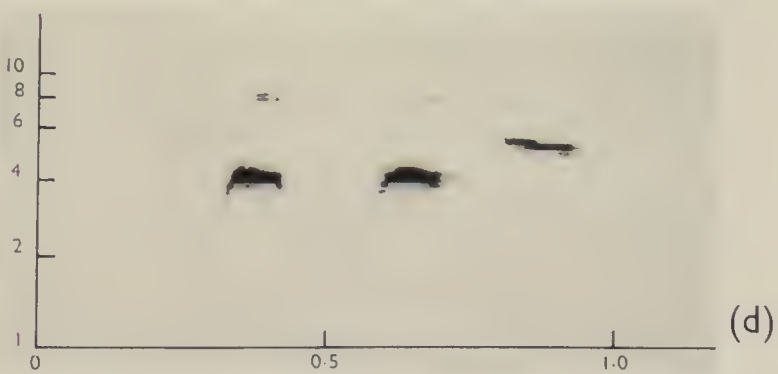
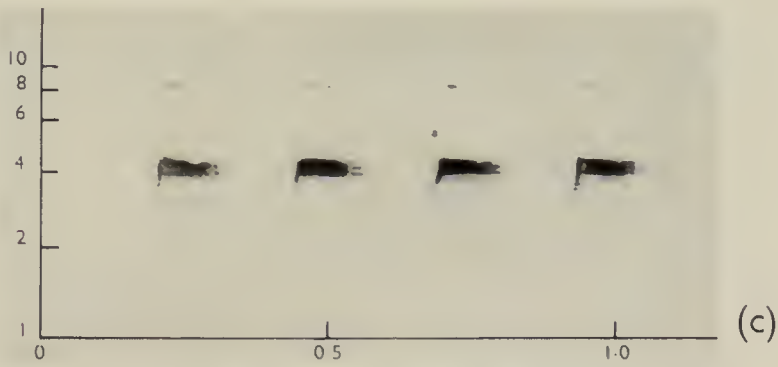
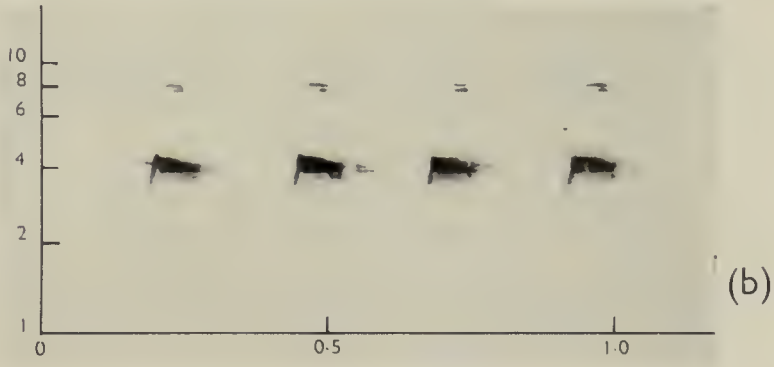
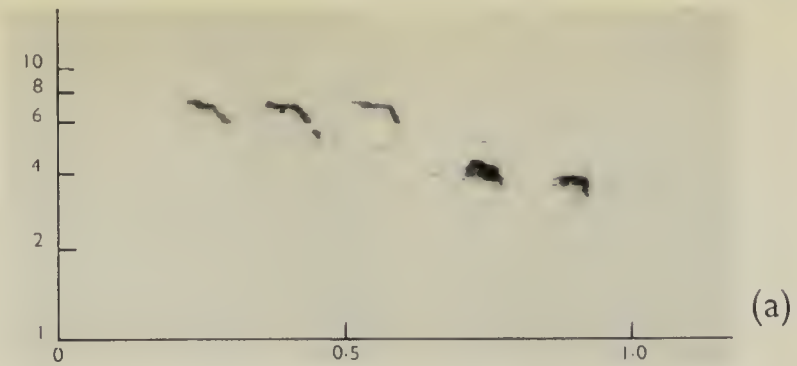
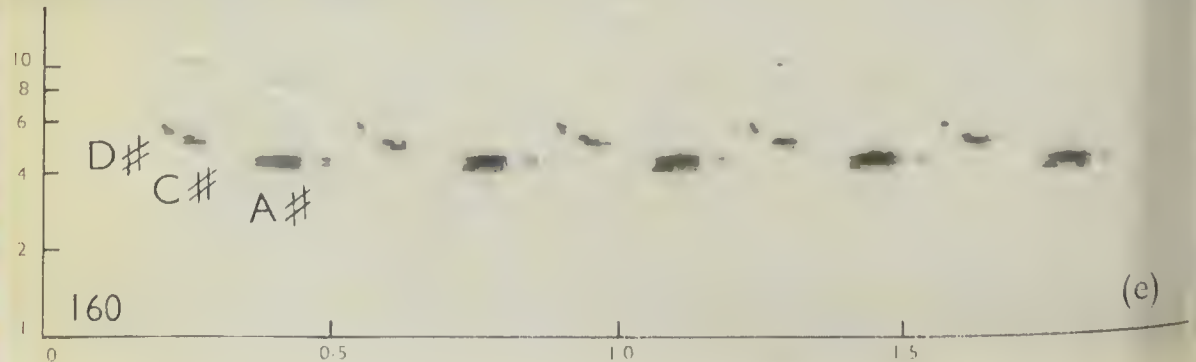
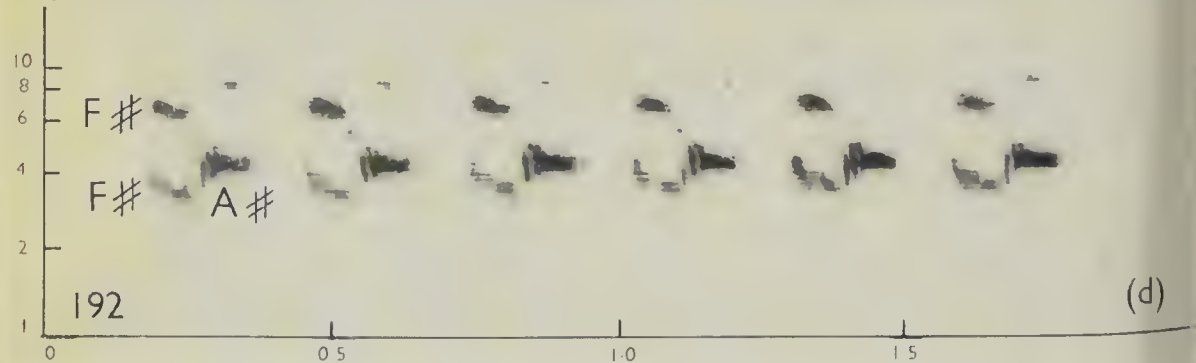
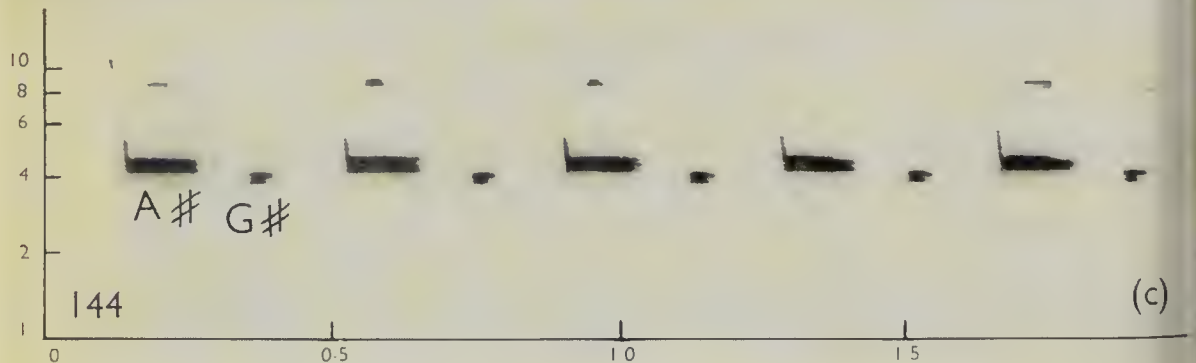
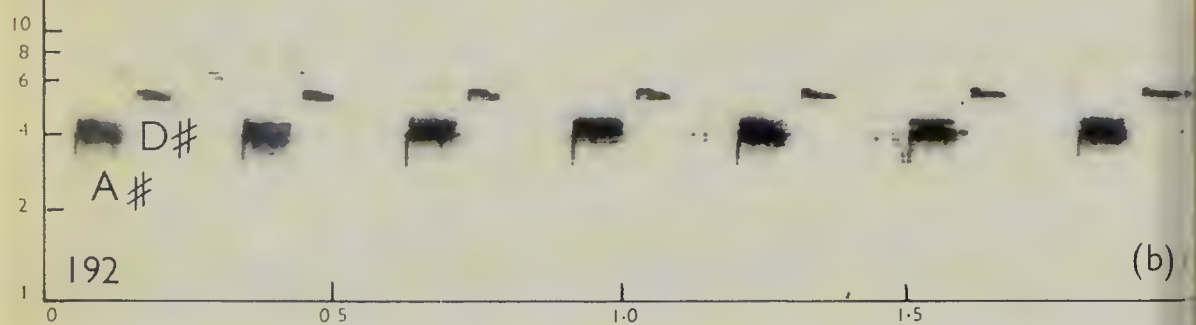
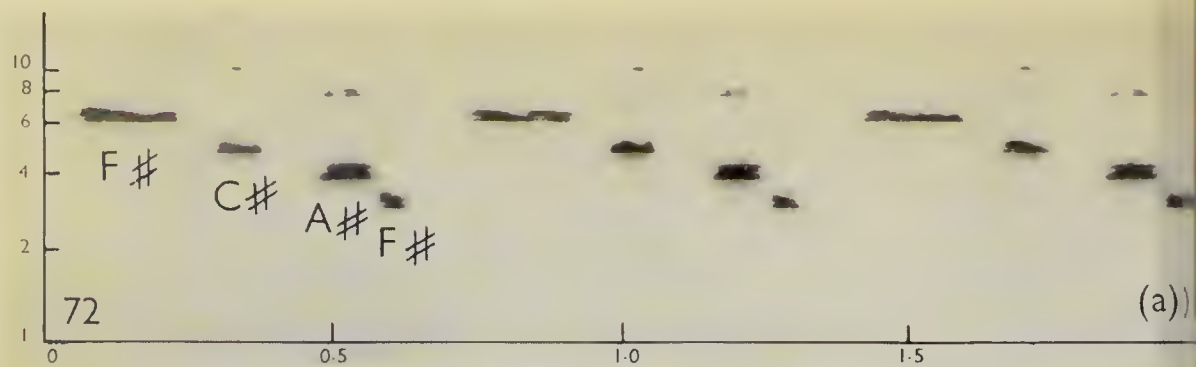


PLATE 59





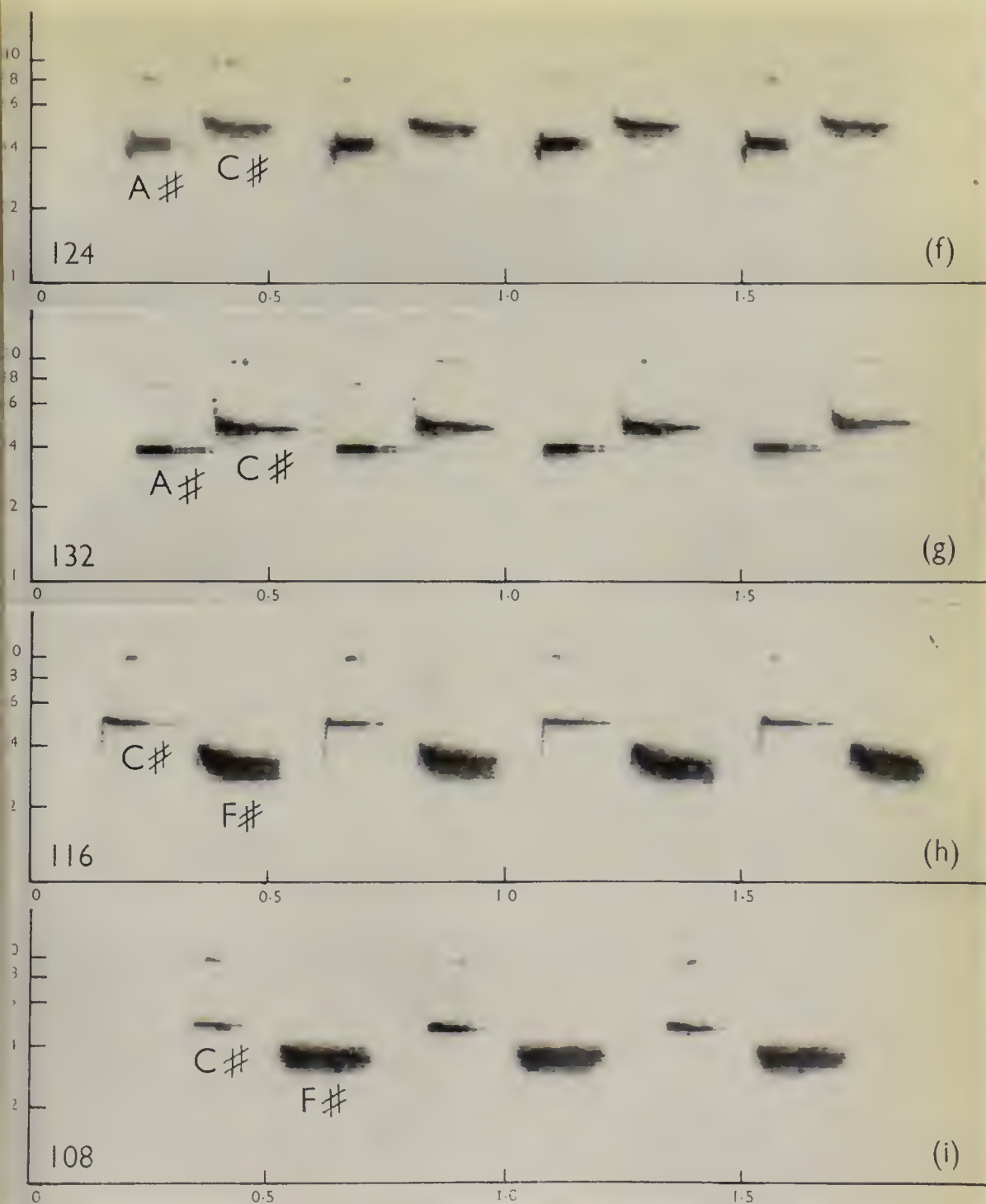


PLATE 60. Songs of two Great Tits (*Parus major*). (a) to (e) are five of the seven songs forming the repertoire of one male, Bluewhite. His other two songs are shown in (f) and (h) for comparison with two similar songs, (g) and (i), of a rival male; (f) and (h) are the two songs in Bluewhite's repertoire which most closely approximate to (g) and (i)—see page 394—and, in song duels between these two, (f) is used against (g) and (h) against (i). The pitch assigned by the human ear (the mean of the frequency range on the spectrogram) is given under the notes comprising the first unit of each song. The figure in each bottom left-hand corner represents the number of units delivered in one minute and shows the tempo. The elements of musical variation of these songs are discussed on pages 391-393

The vertical scale is the frequency in kilocycles per second, the horizontal the time in seconds

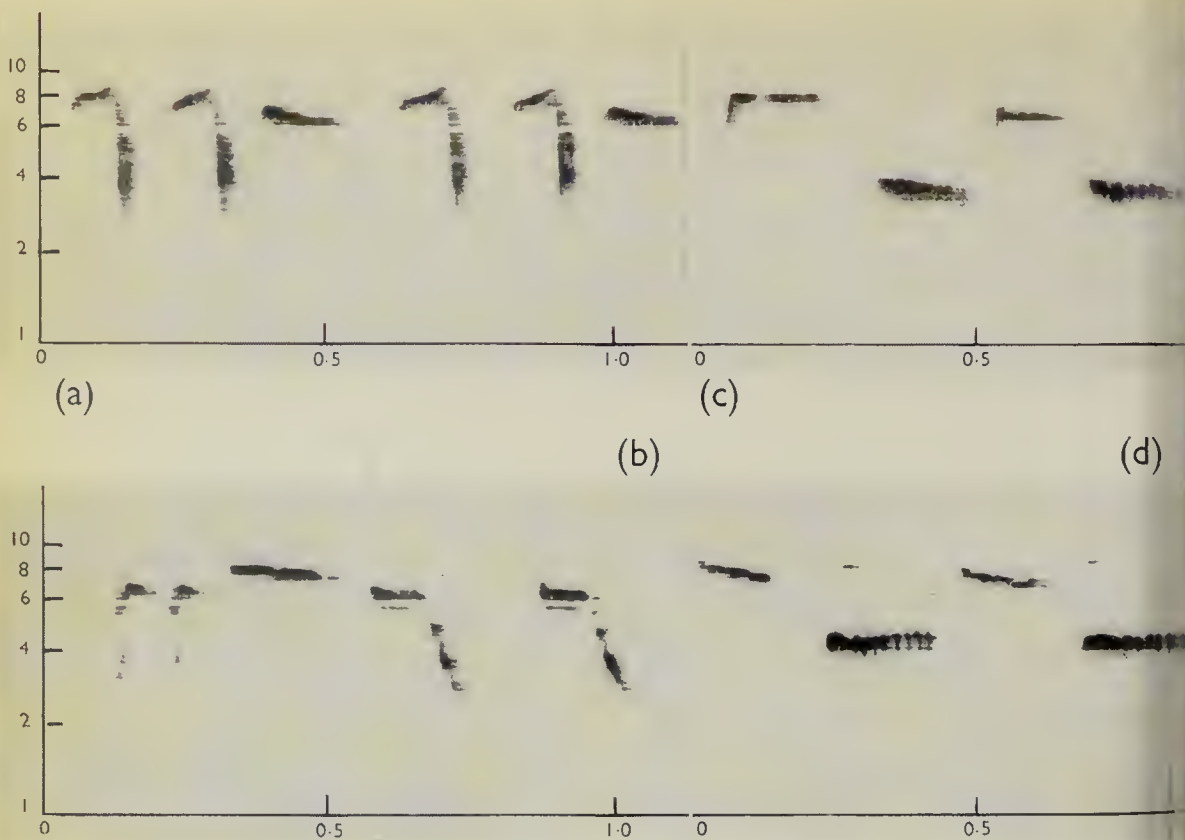
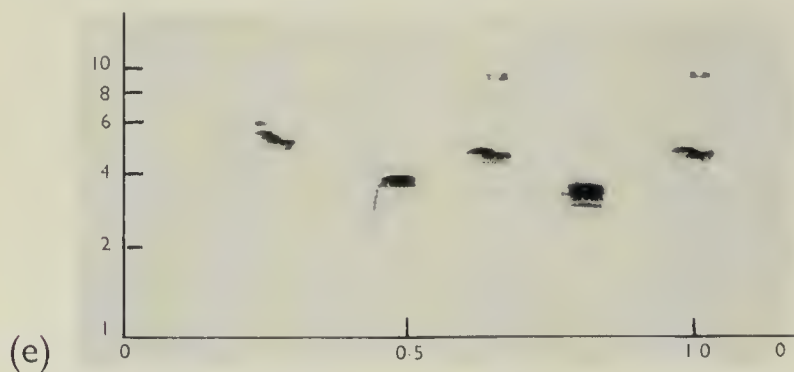


PLATE 61. Calls of Great Tit (*Parus major*). (a) and (b)—above left—are examples combining *pee* note variants with other musical and non-musical sounds; the latter are seen as long vertical patterns over a wide range of frequencies (page 386). (c) and (d)—above right—are vibrant calls in which the *pee* note variants composing them are widely separated in frequency and long in duration (page 387)



An example of a "duple" call, recorded from a male (page 411 in next issue). Of the five notes used, the first is one of this bird's *pee* note variants, the third and fifth another, and the fourth a different one again; the second is his *tink* note (this is not the male whose *pee* note variants and *tink* are shown on plate 59)



PLATE 62. Nest of Bonelli's Warbler (*Phylloscopus bonelli*), Spain, June 1961. A domed structure like those of other leaf warblers, but with a markedly flat oval entrance, it is made of grasses and leaves, and may be lined with hair (but not feathers). It is normally on the ground and often, as here, camouflaged in a litter of fallen leaves and twigs (pages 395-399) (photo: M. D. England)





PLATE 63. Bonelli's Warbler (*Phylloscopus bonelli*) feeding young, Spain, June 1961. Little larger than a Willow Warbler, it is greyish-white below and grey-brown above, with a whitish superciliary, a patch of yellow at the carpal joint, and a yellowish rump; the last is often difficult to see (page 396). At least four young were in this nest; the normal clutch is five (page 398) (photo: M. D. England)



PLATE 64. Bonelli's Warbler (*Phylloscopus bonelli*), Spain, June 1961. Below, the area in which this nest was found, a typical habitat of pines and oak scrub at 3,500 feet. This species breeds in woodland with little undergrowth, often on hillsides between 2,000 and 6,000 feet (page 397) (photos: M. D. England)



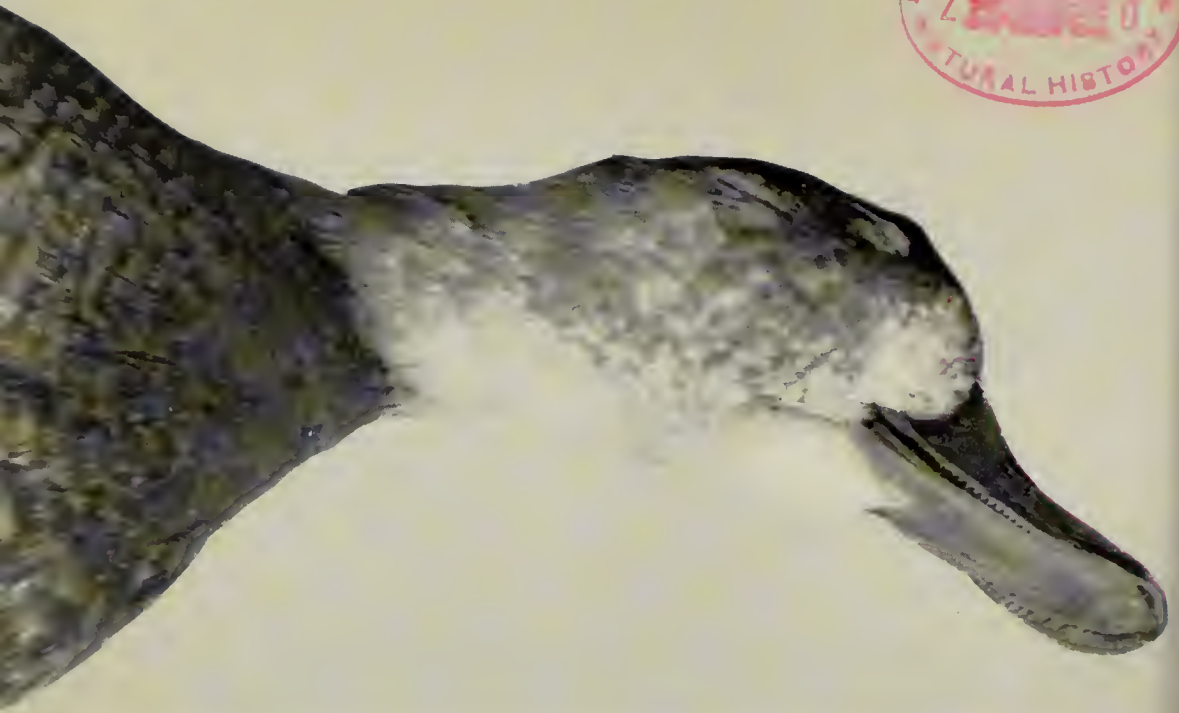
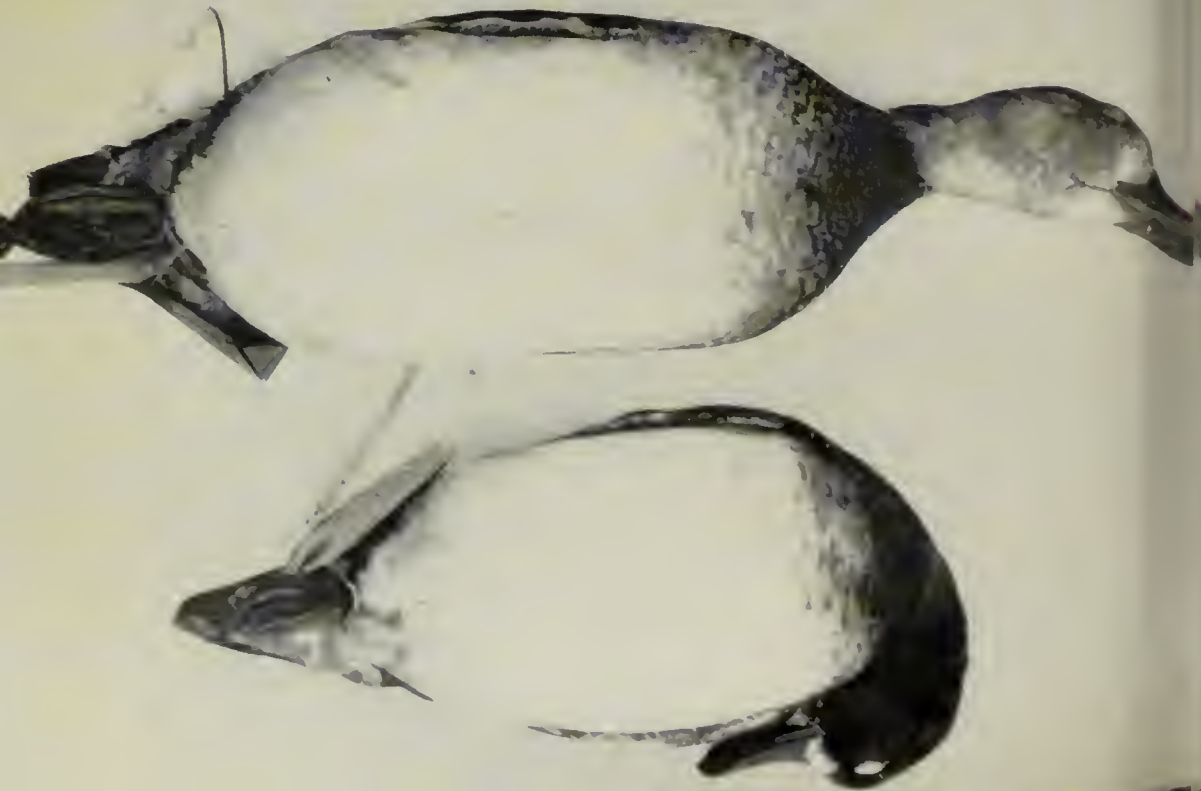


PLATE 65. Juvenile male Tufted Duck x Pochard (*Aythya fuligula* x *ferina*) shot in Hertfordshire, 1886. Above, head and neck, showing marked but ill-defined white patches at base of bill, white chin and whitish neck. Below, the underside compared with an adult female Tufted Duck (pages 399-402) (photos: Bryan L. Sage)



of the many juveniles I have had under close observation. All male Great Tits that I have heard—except those in their first season of singing—have had a repertoire of at least four clearly distinguishable songs.

As with many other species, the song of the Great Tit is associated with two particular situations: (a) those involving the ownership of, or disputes concerning, territory; and (b) the absence of the female. The relationship between the *tink* call and song has already been discussed and I have suggested that the internal state of the bird has some effect, regardless of external circumstances, on the times when it sings and the amount of song. The singing of territorial neighbours undoubtedly acts as a strong stimulus though, as I have already pointed out, a male whose threshold of song is high (i.e. one who may already have sung his full quota for the time being or whom other internal factors may be influencing) will respond to others' song by "tinks" from within his own territory. (I have a strong impression, which I have not yet verified by sufficient observation, that individuals have an internal rhythm resulting in a flood and ebb tide of song. Thus, for a number of days an individual will sing a great deal, regardless of external circumstances such as weather conditions or the amount of song from immediate territorial neighbours; then follows a shorter period during which the same bird does much less singing except when external circumstances, so to speak, drive him to do so—and during this period he will often respond to others' song by "tinking".)

L. Behaviour during song

While singing, as in all its activities, a Great Tit is an engaging creature to watch. For a lengthy spell, it often sings from the highest perch available on one of a number of chosen trees; turning, from time to time, to face north, south, east and west. During less intense song spells it sings at lower levels and will constantly interrupt itself to tear at buds, hammer at bark, or preen, scratch or peck at its toes. If it is engaging in a song duel it will often fly from one song post to another, and then another, each taking it nearer the rival against whom it is singing. As the rival may do the same, they then end up facing each other on their respective border song posts. Or the converse may take place, each bird starting at the boundary and retreating inwards towards the heart of its territory.

During reproductive fighting, snatches of the various songs in the individuals' repertoires are interspersed with the various aggressive-type calls already discussed, "pit-churring" and a splutter of "spicks", "pits", "chits" and other non-musical sounds. (A really fierce skirmish provides the most striking demonstration of the Great Tit's vocal virtuosity and is one of the many occasions causing one to bless

the invention of the tape-recorder—if it has been switched on.)

Once nesting has begun, a great deal of song is delivered close to the nest site, particularly while the male is waiting for the female to emerge from the nest hole at dawn. But if the male is roosting at some distance from the nest hole, he is likely to start the morning by “beating the bounds” with song *en route* for the nest site, and he will end the day in the same way.

M. *Season of full song*

The chart of song periods in *The Handbook* shows the Great Tit as irregular but frequent between mid-August and mid-October, as exceptional from mid-October to mid-December, as irregular but frequent for the last two weeks of December and then as constant until mid-June. My observations show that in any one year individuals vary in the times of onset of full song; for instance, in 1960-61 there was a difference of three and a half weeks between the two males whose territories included part of our garden—though both were spending the major part of the day on their territories and both were keeping close contact with their mates. Apart from these individual variations, it is my impression that, as a general rule, those birds whose territories are close to houses tend to come into song earlier than those in pure woodland, some of the former being in full song by the end of November.

I consider an individual to be in full song when his complete repertoire has re-entered his vocabulary. This is usually an index of the amount he is singing. At the period when he is beginning to sing again, he normally starts with only one or two of his songs. As song becomes more frequent the other variants are added.

N. *Female song*

Hinde states that “singing by female Great Tits is not common, but was heard fairly often when the females were taking part in reproductive fighting, and also just before nest building, in situations which could be interpreted as ‘absence of the male’.” I agree with him that female song is not common, but my observations have given only one instance of true song during reproductive fighting and none at the time of nest building. What one does sometimes hear from females at these times is, as I have already stated, either “tinking” or “peetinking”. I think this distinction is important since, although “peetinking” is aurally very similar and closely related to song, both it and “tinking” indicate that the individual is inhibited from true song.

I also disagree with Hinde in attributing the stimulus for female singing to “absence of the male”. The instance I have quoted above (given in detail in section H5), in which a female was temporarily

forced to undertake the defence of a territory, suggests strongly that song by female Great Tits is produced in situations like that described by Nice (1943). Discussing the function of song in female birds, she wrote: "Where song is largely specialised for territorial uses, and territorial defence is primarily taken over by one sex, then song is most highly developed in this sex, and may almost disappear in the other. *In individual cases where territorial responsibilities are thrust upon the normally less active bird, it may respond with excellent song*" (my italics).

Although the male Great Tit is undoubtedly stimulated to sing in the absence of the female, there seems no doubt that, in this species, song is "largely specialised for territorial uses" and there is thus good reason for it to be highly exceptional in females.

O. *Song: musical analysis*

(This section has been written jointly by the author and R. E. Jellis)

1. Compared with the songs of such singers as the Robin (*Erithacus rubecula*) or Blackbird (*Turdus merula*), the Great Tit's is a simple utterance. It consists of units of two notes (the most common form), or three or four. We have neither transcribed nor recorded any singer with a unit of more than four notes. The bird normally repeats each unit several times, and then, after a pause, delivers several more units in succession. For example, the bird may utter its song thus: 7 units, pause, 8, pause, 8, pause, 7, pause, 5, pause, 5, pause, 5, pause, 6. During intense spells—particularly in song duels—there may be a single utterance of as long as twenty seconds. One or two such lengthy utterances are almost invariably followed by a very short one.

It is rare for a Great Tit two or more years old to have less than four clearly distinguishable songs in its repertoire; five is quite common; the most we have noted or recorded is seven.

2. Given two or more notes to play with, a bird, like a human musician, can vary them in five basic ways: (a) actual pitch; (b) interval; (c) rhythm and stress; (d) tempo; and (e) tone-quality.

(a) Aurally, actual pitch can only be assigned approximately, to the nearest semitone of the tempered scale on the piano or the pitch-pipe. It is extremely useful, nevertheless, as a guide to the range, and the relationship, of the notes which are used by a bird in different songs.

(b) Intervals of a second or full tone, major and minor thirds, fourths and fifths have been recorded and transcribed in two-note songs, and varying combinations of them in the three- and four-note songs.

(c) We use "rhythm" to indicate the relative duration and grouping of the notes of a song, and "stress" to mean the note which is most strongly emphasised—the first beat of the bar, as it were. In a two-

note song, there are a limited number of variants which the bird can make with rhythm and stress alone and at one time or another we have recorded or transcribed all of them. In the case of three- or four-note songs, the possible variations are enormously increased.

(d) There is a wide variation in the speeds used by an individual bird in his different songs. To make a formal basis for comparison in the field, and when analysing recordings aurally, we have adopted the musical method of metronome marking. A metronome mark of 120 means that the bird would deliver 120 song units in one minute of unbroken utterance, or two in every second. Since, of course, the bird does not, obligingly, utter song units for a full minute without a break, one obtains the metronome mark by a count of the longest possible stretch of units over a convenient period of seconds and by multiplying accordingly. This is a reasonably accurate measure of the variations in speed between either the songs of an individual bird, or of two different singers. The results obtained by this method check well with measurements made on spectrograms. All the individuals we have heard had among their songs three of considerably different tempi: one slow, Mm 70-120; one medium Mn 120-160; one fast, Mm 160-200.

(e) Apart from variation in voice quality between one bird and another, there is also variation between one note and another produced by the same bird. For example, in a two-note song, both notes may be fairly "pure", or flute-like, to our ears, or one or both notes may sound "reedy" rather than flute-like, or seem to have more "noise" in them; or their exact pitch may be less obvious (at half speed or on the spectrogram the latter may be revealed as a steep glide covering a semitone or more).

3. Plate 60 (a-f and h) shows spectrograms of the seven songs forming the present repertoire of one individual. It will be seen that the singer makes use of all the elements of variation discussed above. The first song (a) is extremely distinctive, being, in fact, the common chord of F# Major sung as a descending arpeggio in a dotted rhythm, with the stress placed on the tonic at the top and on the mediant. The next four songs (b-e) each make use of a different interval.

Variations of rhythm and stress are shown by the way the notes within each unit are spaced in time, and by their relative duration; and tempo is measured by the distance between the beginning of the first note of one unit and the first note of the next—the shorter the distance the quicker the tempo. In these five, there is one slow song (a), two medium (c and e) and two fast (b and d). The two medium songs differ in pitch, interval and stress, however, as do the two fast ones.

The fourth song (d) also differs strikingly from any other in this repertoire. It is totally dissimilar in tone-quality (see below). The

spectrogram reveals that the first note of each unit consists of two sounds, approximately an octave apart in pitch. They are simultaneously delivered, but their time patterns are such that it seems possible that they are independently generated by the bird. We have found that listeners differ in their selection of the musical interval they are hearing, so that one will state that the song unit is an ascending major third and another that it is a descending minor sixth.

The fifth song (e) is an example of one which, heard at normal speed, sounds to the human ear as if it were composed of two notes with the top note a steep glide, whereas, in fact, as listening at half speed and the spectrogram both show, it is a three-note song.

The other two songs in the repertoire (f and h) are both medium-slow in tempo, but differ in pitch, interval, rhythm and stress.

It may be that the fifth element of variation discussed above—tone quality—is revealed in the spectrograms by the considerable difference in the frequency spread of the notes, by their duration and by the alteration of the pattern of frequencies within a single note. But to relate in detail the highly subjective aural appreciation of tone-quality to its physical basis goes far beyond the scope of the present study. However, we must stress the fact that all the songs illustrated have considerable variations of tone-quality.

Musicians will, no doubt, be interested to observe that this individual operated within a strongly tonal framework—within the key of F# Major. But this was not the case with the other five birds whose full repertoire was recorded.

P. Song: significance of variation

Hinde remarks that the significance of song variation in the Great Tit is obscure: "... one individual may use several different song types in succession when there has been no apparent change in the external situation ..."

It does not seem to me that one has far to look for the first circumstance which will motivate an individual to ring the changes in song. This has been described by Hartshorne (1958) as the "anti-monotony" principle; "... it appears ... that even birds," he writes, "can stand a prolonged succession of songs or phrases separated by brief intervals of silence (less than two or three seconds) only if there is a considerable variety among the songs or phrases. ... Birds in this respect act musically as we do, save that their temporal span, beyond which monotony is not felt, is brief and that very simple variations satisfy them." Since a Great Tit may spend a considerable proportion of its day in singing (which may include periods of as long as fifteen minutes without a break of more than one minute), it seems reasonable to assume that the "anti-monotony" principle is one good reason for it

to vary its songs. That this is so is, I think, evidenced by the fact that, in a prolonged burst of singing, a Great Tit always does change from one to another of its songs and, in doing so, normally switches to a song of a different tempo. The longest I have ever heard an individual continue to sing the same song was eight minutes, by the end of which time I certainly felt that it was high time for a change. Three to five minutes is a much more usual period for one song to last before another succeeds it.

The second cause of variations in the songs of individual birds and similarity in a local repertoire is the tendency for territorial neighbours to produce approximations to their rivals' songs. During song-duels, each male tends to use that song in his repertoire most closely similar in tempo and rhythm to that which his rival is singing (plate 60, f and g, h and i, shows two instances of this). And if, when a Great Tit is singing, one plays him the recording of a different song in his own repertoire, he tends to switch to that song within a few seconds. In spite of this tendency to use similar song types during song-duels, Great Tits also maintain variants in their song repertoire which do not approximate to those of their territorial rivals. For instance, in the case of the bird whose full repertoire is illustrated in plate 60, though no other within a half-mile radius sang anything remotely like his first song (a), this has remained in daily use throughout two seasons. In this respect the Great Tit would appear to differ from the Chaffinch (*Fringilla coelebs*), for Marler (1956b) found that males of that species tended to drop songs which did not approximate to those of their territorial neighbours.

There is one other interesting possibility in the variation of songs which should be mentioned. Do any or all of the songs have any special relation to any special external circumstance? For example, does one song, rather than any of the others, tend to be sung in the absence of the female? In the cases of two birds where I have been in a position to ask this question with some reasonable chance of acquiring a useful lead or two, I have had entirely negative results. It seems to me that, apart from the already mentioned tendency to use the nearest approximation in tempo and rhythm to his rival's during a duel, a Great Tit may sing each or any song in his repertoire in any circumstance.

(To be concluded)

Studies of less familiar birds

114. Bonelli's Warbler

By I. J. Ferguson-Lees

Photographs by M. D. England

(Plates 62-64)

THERE IS NO MENTION of Bonelli's Warbler (*Phylloscopus bonelli*) in *The Handbook* because the species had not been recorded in Britain when that work was written. It was, in fact, only thirteen years ago that the first one was found over here—at Skokholm, Pembrokeshire, on 31st August 1948 (Conder and Keighley 1949)—but since then it has laid firm claim to inclusion on the British list by being recorded a further seven times.* As these seven occurrences have all been since 1954, it is now turning up at an average rate of one a year.

Apart from our native Willow Warbler (*Ph. trochilus*), Chiffchaff (*Ph. collybita*) and Wood Warbler (*Ph. sibilatrix*), this is the only other leaf warbler which is fairly common and widespread in Europe. The Arctic Warbler (*Ph. borealis*) and Greenish Warbler (*Ph. trochiloides*) are on the fringes of their ranges in Fenno-Scandia and the countries east of the Baltic; the other members of this mainly Asiatic genus are but rare vagrants. Indeed, Bonelli's Warbler is primarily a European bird because, outside that continent, it is found breeding only in the very north-west of Africa (Morocco to Tunisia) and the countries flanking the eastern Mediterranean (parts of southern Turkey, and probably Syria, to Palestine). Within Europe it is really a southern species, but one which has been spreading northwards this century (see, for example, Lasnier 1952). It breeds from Portugal and Spain north through France (though not the extreme north of that country) to southern Belgium; and east from there through Switzerland, Italy, south Germany, Austria, Czechoslovakia, possibly Poland, Yugoslavia, southern Bulgaria and Greece (the birds of the Balkans and Near East are greyer and longer-winged, and have been separated as *Ph. b. orientalis*). Its entire breeding range is thus contained in a rectangle about 2,500 miles wide and 1,400 miles deep, between 10°W and 35°E and between 30°N and 50°N. It winters in the northern half of Africa south to about 10°N. It should be added, too, that it is a rather more local bird than is suggested by the maps in most editions of the *Field Guide* and in K. H. Voous's *Atlas*. For example, it is missing as a nesting species from fully half the Iberian peninsula, including the south-west corner and much of

* See footnote on page 396.

the east; this is largely due to its habitat requirements (see below).

Except that it extends, as we have already seen, into Czechoslovakia and the Balkans, the European breeding range of Bonelli's Warbler is very similar to that of the Melodious Warbler (*Hippolais polyglotta*) and it is interesting to note that the patterns of the records in Britain and Ireland are almost identical. All but one of the eight Bonelli's Warblers have been in autumn, and those have all been between mid-August and mid-September in western Britain and the Irish Sea area—Caernarvon (two), Pembroke, Devon, Cornwall and Co. Cork, with Dorset the most easterly.* On the other hand, like most of the few spring occurrences of Melodious Warbler, the only spring record was on the east coast—at Walberswick, Suffolk, on 29th and 30th April 1961 (full details still to be published). The fact that this pattern is so similar to that of the Melodious Warbler suggests that the bird was probably overlooked in the past, particularly as the Irish Sea area was formerly not nearly so well covered as the east coast. We certainly cannot say at the moment that this recent crop of records is due to the northward spread in France. But it does seem that the species may still be spreading, for a male sang for two weeks in the Netherlands in May 1958—the first record for that country (van den Oord 1959).

The general plumage of Bonelli's Warbler is described briefly in the caption to plate 63, but the species is more easily recognisable than any black-and-white photograph can show. It is fractionally larger than a Willow Warbler or Chiffchaff, and very similar in general shape, with the longer wing of the former species. Only three of the autumn vagrants trapped in Britain have been weighed and these varied from 6.75 gm. to 7.4 gm. when first caught; one on Bardsey, which was retrapped five times in the next seventeen days, reached a final weight of 9.0 gm. (Arthur 1960), but an adult I weighed in the breeding season in Spain was only 7.2 gm. These weights are comparable to those of Willow Warblers and this species is certainly quite a bit smaller and less heavily built than a Wood Warbler. In many books, including the *Field Guide*, the yellowish rump is given as the best field character, but this is often difficult to see when the bird is perched because it is obscured by the folded wings, and it can easily be missed in flight unless the bird is going away from one; it should be added, however, that it seems to be more conspicuous in the worn plumage of early autumn and it is likely to be more visible in a tired migrant. On the other hand, a touch of bright yellow at the bend of the closed wing and a yellowish patch formed by the edges of the inner primaries and outer secondaries are usually relatively conspicuous, particularly as they contrast with the generally pale appearance of the greyish-white

*Another, the third this year and the ninth altogether, was recorded on Fair Isle on 22nd September 1961; this is still consistent with the Melodious pattern.

under-parts and grey-brown upper-parts. The head tends to be purer grey and sometimes looks noticeably pale in the field.

One call-note is of the Willow Warbler type, but less plaintive and more whistling, and inclined to vary from one to three syllables instead of being consistently disyllabic (*wheet*, *hoo-eet* or *pehoo-eet*, the syllables tending to be clearly separated); there is also a single or double metallic note which is used more in autumn and is quite harsh by comparison. The song is a monotonous trilling rattle of about half-a-dozen notes, recalling a slow version of the first half of a Wood Warbler's song and yet with a certain resemblance to the songs of both Cirl Bunting (*Emberiza cirrus*) and Lesser Whitethroat (*Sylvia curruca*).

Plate 64b shows the habitat in which M. D. England took his photographs—an area of pines and oak scrub on a gentle hillslope about 3,500 feet above sea-level in the Sierra de Guadarrama, Spain. It is often stated that Bonelli's Warbler is primarily a bird of mixed woodland with plenty of pines, but in fact it may be found in pure deciduous and pure coniferous woodland equally well. Nor does it have a preference for oak or pine as Vaurie (1959) suggested. It is no less at home in beech, birch, spruce or larch; it will nest in mixed deciduous woods of sweet chestnut, alder, maple, mountain ash and so on, and even in hawthorn copses. Sometimes the canopy is dense and the wood is dark, sometimes it is quite light (see also Amann 1953). Two things do seem important to this species, however, apart from the presence of trees in some form, and they are altitude and sparse ground cover. Even the "damp cork groves" referred to in the *Field Guide* are, I suspect, those occurring on the lower hillsides of southern Spain. In my experience, in fact, Bonelli's Warbler is at its most numerous between about 2,000 and 6,000 feet, though Cramp (1956) found it the second commonest bird in June in the woods of the Landes, France; this is not very far above sea level. It has been suggested that a southerly aspect is necessary, but there seems to be little evidence for this and Amann particularly remarked that it also nested on north-facing slopes in Switzerland. Incidentally, it is worth noting that he found a density of nine pairs in 11 hectares (or about 27 acres), but in parts of Spain the bird is very much commoner than this and a density of a pair per acre may be reached.

At around 4,000 feet one may find Bonelli's Warbler in clumps of hawthorn and other smaller trees, provided that the growth of juniper, berberis or bramble underneath is not too thick. Indeed, any heavy bush growth under the trees tends to result in the absence of this species, though seedling oaks and other trees a few inches high are often a feature of the habitat.

The nest (plate 62) is the usual domed ball typical of *Phylloscopus*,

though the oval side-entrance tends to be more flattened than it is with Willow Warblers and Chiffchaffs. The narrowness of the entrance was particularly commented on by Amann and also by M. D. England (though it is not particularly apparent in these photographs because the nest is inevitably enlarged by the activities of well-grown young). As a result, the whole nest is usually extremely difficult to see. Those I have found have been either in banks or in depressions in the ground, and these are the normal situations. It is worth drawing attention, however, to the description given by Zinder (1953) of a nest which was in a hole in a wall in Switzerland and some 63 inches above the ground (*cf.* the similar sites for Willow Warblers summarised in *Brit. Birds*, 46: 69). Nests are basically constructed of dry grasses, but concealment is aided by the liberal use of other materials from close at hand. For example, one nest I found in Spain was constructed in a hollow where there was a thick carpet of pine needles and a scattering of "skeleton" thistle leaves; when this nest was almost complete the female made repeated journeys to a spot some nine yards away to bring back pine needles as a covering for the roof, and later she made several journeys to get dead thistle leaves as finishing touches. The lining is usually of fine grasses, with a few rootlets and sometimes a little hair, but apparently never any feathers (see also Amann 1953, Jourdain 1937).

The nest is built by the female alone (Amann), while the cock sometimes dances attendance and sometimes sings steadily from his nearer song-posts. Although the species arrives in southern Europe in the first half of April, it is a late breeder even in Spain where clutches are seldom complete before mid-May (Jourdain), perhaps because it is mainly a hill and mountain nester. The nest referred to at the end of the last paragraph was complete on 23rd May, but not laid in until twelve days later. The most common clutch is probably five eggs, but four and six are apparently not infrequent and as few as three were recorded by Amann. The eggs are white, heavily spotted with reddish. Amann found that incubation began with the penultimate egg at the latest. This is by the female alone. Like other *Phylloscopus*, she comes off the nest to feed, uttering a very persistent and penetrating call *snee-eet* much of the time she is away; such a call is characteristic of at least the European members of this genus and is the one thing which makes their nests reasonably easy to find. A harsher and more urgent version of it is used continually when there are Jays (*Garrulus glandarius*) or other predators in the vicinity, and the birds make no attempt to approach the nest while such danger is at hand. Bonelli's Warblers are often very tame with humans, however, returning to feed when people are standing only a few feet away.

Most of the above is based on my own observations of this species in Spain and elsewhere, supported by some useful data provided by Dr. G. Beven and M. D. England on their experiences at the time these photographs were taken. I have been unable to make any real attempt at reading the not very extensive literature on this species, but the bibliography below includes references to most of the main accounts that have been published. Some useful photographs by W. Pfeiffer appeared with Amann's paper.

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An immature male Tufted Duck × Pochard hybrid

By Bryan L. Sage

(Plate 65)

IN A RECENT PAPER Perrins (1961) gave a detailed description of a duck seen at Sutton Courtenay, Berkshire, in December 1957 and subsequent winters; it had at one time been identified as a Lesser

Scaup (*Aythya affinis*), but, on being shot in March 1960, it was diagnosed as a hybrid male Tufted Duck \times Pochard (*A. fuligula* \times *ferina*). As this was evidently the result of a cross under natural conditions, it is not known precisely which species was the male parent.

In the last few years, too, a number of similar hybrids have been recognised in various other parts of Britain, all of them adult males. With the detailed description and illustrations given by Perrins, field observers now know what to look for in such birds. However, ornithologists also have to contend with the fact that where male hybrids exist, so must females and immatures. What the latter have been identified as in the past is purely speculative, but it is obviously very desirable that descriptions and illustrations of these female and immature plumages should be made available as soon as possible.

Hybrids of Tufted Duck \times Pochard parentage have actually been recorded on several previous occasions, as may be seen by reference to Gray (1958) and Bezzel (1960). For example, this cross took place at Tring Reservoirs, Hertfordshire, in 1886 and 1887. In the former year a brood of nine was reared and, in the words of the late Lord Walter Rothschild, the young "were much like young Scaup (*A. marila*) in appearance". One of them, a juvenile male, was shot (the exact date is not recorded) and given by Lord Rothschild to the British Museum (Natural History) in November 1886. I have made a close examination of this bird and am thus able to describe the juvenile male of this hybrid; plumage details and measurements will be found in the APPENDIX, and photographs are reproduced on plate 65.

I have also compared the specimen with immature Scaup, Tufted Duck and Pochard. Seen floating on the water at a distance, the juvenile hybrid would exhibit upper-parts of a uniform cinnamon-brown, with white on the face, cheeks and neck, and a pale gingery-coloured breast. If the bird were to raise its body and flap its wings as ducks so often do, the under-parts below the breast would show as pure white and the white wing bar might also be noted. The most striking characters, as shown in plate 65a, are the white chin and the white patches at each side of the base of the bill, the latter *not extending across the forehead*. In flight the white secondaries with dark tips would form a wing-bar identical to that of the Tufted Duck.

Some plumage phases of the Tufted Duck include white at the base of the bill, which may or may not extend across the forehead. Plate 65b shows the hybrid with a female Tufted Duck which has a white spot on either side of the base of the bill. In all plumages the Tufted Duck is darker on the head, neck and upper-parts than the hybrid. So far as immature Scaup are concerned, confusion should not readily arise, owing to the absence in the hybrid of any noticeable vermiculations on the back and mantle, and also because of the lack of grey on

these parts. In addition, female Scaup are much darker brown and have the extensive white frontal shield running across the forehead. A possible source of confusion lies with the female or immature plumages of the Pochard which often exhibit a varying amount of white on the cheeks and throat, and are only a little darker brown than the hybrid. However, the white on the face of the Pochard is never so marked around the base of the bill and its under-parts are browner and more mottled.

Perrins referred to the possible similarity of the Sutton Courtenay bird to the Scaup \times Tufted Duck hybrids described by Voous (1955). I have seen one of the specimens mentioned in the latter paper, and also have in my collection a specimen of identical parentage bred in captivity and observed in life. In both these the vermiculations of the upper-parts are, in fact, coarser and more marked than in the Sutton Courtenay individual, and in life the head and neck, at certain angles, showed a considerable amount of metallic green gloss; the bills of these birds are also much broader and more spatulate than in the Tufted Duck \times Pochard hybrids.

In conclusion, it is worth drawing attention to the bird mentioned by Yarrell (1843) and described and figured by him as the "American Scaup (*Fuligula mariloides*)". This specimen is now in the British Museum (Natural History) where I have examined it. According to the label, it is a hybrid of Pochard \times Scaup parentage. If Yarrell's bird is compared with Perrins's description of the one from Sutton Courtenay, however, it will be seen that they are virtually identical. The "rich Orleans plum-colour" of the head and neck described by Yarrell is, in fact, a coppery-brown with a strong metallic purple gloss, while I would call the upper breast blackish-brown and not "jet black". In my opinion, Yarrell's specimen, if seen in life, would be quite indistinguishable from the Sutton Courtenay hybrid.

ACKNOWLEDGEMENTS

I am indebted to Mr. J. D. Macdonald of the Bird Room, British Museum (Natural History), for allowing me access to material in his charge and for arranging the loan of specimens. Dr. James M. Harrison helpfully lent me comparative material from his collection. Professor Dr. K. H. Voous kindly sent me one of the Scaup \times Tufted Duck specimens described in his paper, and my own specimen was bred by Mr. J. O. D'eath, who generously presented it to me. I have also to thank Dr. A. J. Cain of the University Museum, Oxford, for the loan of the Sutton Courtenay hybrid.

APPENDIX—PLUMAGE DESCRIPTION

Head and neck: cinnamon brown, very slightly paler than in female Pochard; large white patch each side of base of bill sparsely flecked with pale orange-brown;

forehead above culmen gingery-brown; chin whitish with faint cinnamon suffusion; cheeks paler than crown and nape, owing to whitish ground colour; foreneck also pale with white ground colour evident

Under-parts: sides of breast and upper breast pale cinnamon with a distinct gingery suffusion (contrasting quite noticeably with the pale foreneck); lower breast whitish, feathers barred subterminally with pale cinnamon; remainder of under-parts pure white, but with pale cinnamon vermiculations on sides of body and flanks; feathers of vent barred with pale brown

Upper-parts: entire back, mantle, rump and upper tail-coverts slightly darker cinnamon-brown than the head and neck; a few feathers on the back faintly vermiculated with greyish-white

Wings: all feathers cinnamon-brown as back and mantle, but secondaries white with brown tips

Measurements: culmen from feathering 44 mm.; width of bill at nostrils 20 mm.; maximum width of bill 23 mm.; depth of bill at nostrils 18 mm.; wing 204 mm.

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Notes

Little Grebe eating bread.—On 3rd September 1961, we were standing by a lake in Kew Gardens, Richmond, Surrey, when we noted that a Little Grebe (*Podiceps ruficollis*) showed interest at the approach of some people to feed the water fowl. As soon as they began to throw pieces of white bread into the water, it swam towards them, though it was clearly afraid of the dozen or so Mallards (*Anas platyrhynchos*) which had immediately gathered, together with a few Coots (*Fulica atra*) and a juvenile Moorhen (*Gallinula chloropus*). However, it hung about on the outskirts of the scrum until it saw its opportunity, then dashed in, seized a small piece of bread and immediately dived as the Mallards closed in. It surfaced a few moments later, several yards away, evidently having swallowed the bread under water, judging by the lump in the middle of its neck which slid down and disappeared as we watched. A few moments later it repeated the performance, this time getting a larger piece of bread which it was still in the act of swallowing when it surfaced.

It then withdrew and floated quietly on the water some ten yards away. We approached and threw it several pea-sized pieces of wholemeal bread. It swam to these at once and rapidly picked up and swallowed three in quick succession, by which time the Mallards

reached the spot and it retreated. Apart from the fact that it should be eating bread at all, we were particularly impressed by the efficient manner in which it took the original two bits from among the Mallards. It was, incidentally, an adult in full breeding plumage.

DEREK GOODWIN and ERIC KNOWLES

Unusual numbers of Spotted Redshanks in Hampshire. Surprisingly high numbers of Spotted Redshanks (*Tringa erythropus*) were seen during occasional visits to The Gins, near Beaulieu, Hampshire, from 1950 to 1958. More frequent observations in 1959 showed that these birds were regular there; quarterly maxima being 10 (21st March), 17 (27th June), 14 (20th September) and 33 (4th October). Since June 1960, therefore, I have kept a much closer watch and the highest counts for each month have been as follows:

June 1960	3	February 1961	15
July 1960	18	March 1961	10
August 1960	18	April 1961	22
September 1960	42	May 1961	1
October 1960	55	June 1961 (one visit)	0
November 1960	30	July 1961	10
December 1960	16	August 1961	27
January 1961	17	September 1961	30

Some counts were by J. T. R. Sharrock, E. Williams, and D. Woolridge. I myself have visited the area almost weekly since June 1960 and only on three occasions, all in June and July, have I not seen any. It appears, therefore, that some are now always present, except possibly in mid-summer. The autumn passage sees numbers at their highest and there is clearly a good-sized wintering population. Incidentally, *The Handbook* does not include Hampshire among the main counties for Spotted Redshanks, but these figures are a good illustration of the change that has taken place in the status of this species in Britain since that was written.

What makes the numbers even more remarkable is that the area concerned is less than a fifth of a square mile in extent. It consists of a few shallow pools set in grazing land, just inside the seawall that runs along the west bank of the Beaulieu River. There are patches of cover in the form of reeds and bushes, and it is liable to flood in the winter. At low tide most of the Spotted Redshanks disperse into an adjoining area of *Spartina*, returning just before high tide when the *Spartina* is covered by water. They fly back singly or in small parties and form larger flocks, 42 being the greatest number in one compact group so far. The pools are used for feeding as well as resting and I have seen one feeding method worthy of note: the birds swim or

wade into the water up to their wings so that when they lean forward to probe in the mud, their tails and rumps pointing skywards are the only parts above the surface. The whole performance is very similar to that of a duck up-ending, but the underwater position is held for less than a second. The birds swim readily and I have frequently seen compact flocks of a dozen or more swimming together as they feed.

J. H. TAVERNER

[In a note on the feeding habits of Redshanks (*T. totanus*) and Spotted Redshanks (*Brit. Birds*, 48: 233-234) G. Bundy and G. Kinsey said that they had seen up-ending only once in the former species and not at all in the latter.—Eds.]

Jackdaws using lead labels for nesting material.—In August 1961, after some months of puzzling over the disappearance of "Serpent" labels from our flower borders at Malmesbury, Wiltshire, we discovered one or two in the grate under a chimney in which a pair of Jackdaws (*Corvus monedula*) had built a nest. On pulling down the nest, we found no less than 67 of our missing labels. They had been twisted into all shapes in the process of being woven into the fabric of the nest. These labels are made of lead and are, of course, very pliable. They measure about 145 mm. × 6 mm. and weigh about 15 gm. each; they are thus nearly six inches long and weigh over half an ounce. In addition to the labels, the Jackdaws had also incorporated a strip of lead 120 mm. × 18 mm. and weighing 34 gm., but the other nesting material was not abnormal. The nest itself was not unusually big and was lined, though I cannot say whether any young had been reared in it.

E. J. M. BUXTON

Great Tits collecting fur from moulting European Bisons. With reference to G. L. Boyle's note on a Coal Tit (*Parus ater*) plucking fur from the remains of a Field Vole (*Microtus agrestis*) (*Brit. Birds*, 54: 288-289), it might perhaps be of interest to add that in the spring Great Tits (*P. major*) sometimes collect fur from the backs and sides of moulting European Bisons (*Bison bonasus*) at Skansen, the Zoological Gardens of Stockholm, Sweden. Jackdaws (*Corvus monedula*) and Starlings (*Sturnus vulgaris*) regularly do the same.

KAI CURRY-LINDAHL

Marsh Tit taking fur from dead Brown Rat.—On 30th April 1961, near Butley Woods, Suffolk, I watched a Marsh Tit (*Parus palustris*) taking fur from a dead Brown Rat (*Rattus norvegicus*). This bird did not need to hold the corpse down with its feet, however, in the way described by G. L. Boyle (*Brit. Birds*, 54: 288-289), as the rat was considerably flattened to the road.

A. K. WOOLSEY

Blue Tit apparently asleep on ground.—On 29th August 1961, at about 9 a.m., my wife noticed a stationary object on our lawn at Roydon, near Harlow, Essex. This turned out to be a Blue Tit (*Parus caeruleus*) which had every appearance of being asleep; even its head was tucked into its fluffed out plumage. When my wife picked it up, it immediately “came to” and flew off strongly with much “swearing” in typical tit fashion. The sun was very bright and it was particularly warm for the time of day. HAROLD BRIDEN

[This seems such a dangerous thing for a bird to do that one wonders whether it can have been entirely fit. Mr. Derek Goodwin tells us that in the spring of 1946 he came upon a Carrion Crow (*Corvus corone*) asleep on the open fells at Catterick, near Richmond, Yorkshire. He got to within four feet of it when the distant alarm-call of a Curlew (*Numenius arquata*) woke it. It took its head leisurely out of its shoulder feathers and then nearly “jumped out of its skin” when it saw him.—EDS.]

Spotted Flycatcher eating blackberries.—At about 12.30 p.m. on 12th August 1961, I saw a Spotted Flycatcher (*Muscicapa striata*) perched on a clump of briars of cultivated blackberry (*Rubus fruticosus*) in my garden at Brentry, Bristol. It tugged at a blackberry and ate it. The process was repeated and it then flew off. I was watching from a distance of about eight feet and had a clear view of the proceedings. The bird was an adult. A. P. RADFORD

[We recently published a note on a pair of Spotted Flycatchers which fed their young on the berries of a honeysuckle (*Lonicera caprifolium*) (*Brit. Birds*, 54: 124-125) and there have been various references to other insectivorous species eating berries on migration. Berry-eating by such birds is probably more common than is generally realised and we are collecting records for a short review of the subject. We should be grateful if relevant observations could be sent to Mr. K. Williamson at the B.T.O., 2 King Edward Street, Oxford.—EDS.]

Letter

The need for distinctive bird names

Sirs,—In an editorial in January 1953 (*Brit. Birds*, 46: 1-3) you announced that you tentatively proposed to desert the current usage of that time, as represented by *The Handbook of British Birds* (1938-41), and change the vernacular names of a number of birds on the British list. Among other modifications, you dropped the qualifying adjective “Common” applied by the authors of *The Handbook* to specific names

which are also often used in a collective sense, including Heron, Eider, Buzzard, Partridge, Crane, Snipe and Curlew. You have now published (*Brit. Birds*, 54: 255-256) what appears to be a completely spontaneous letter from a foreign observer, Louis J. Halle, complaining that current English vernacular names lack distinctness. Please, may we have some of our adjectives back?

At the same time, may I appeal for more modifications of present usage—represented, I suppose, by *A Field Guide to the Birds of Britain and Europe* (1954)—in favour of even greater simplicity? In particular, may I propose abandonment of some of those great, long, cumbersome names, such as "Great Crested Grebe", "White-winged Black Tern", "Great", "Middle" and "Lesser Spotted Woodpecker", "Lesser Short-toed Lark" and, especially, "Red-flanked Bluetail", which for generations have continued to expose bird-watchers to ridicule? May I suggest that, while adhering as closely as possible to established usage, we should never give a species a name which has a collective meaning without adding a qualifying adjective—but that as far as possible we should only use one adjective, and keep this adjective a reasonable one? In this way it should become possible eventually to bring about a painless transition to a much more sensible, convenient and, let us hope, stable vocabulary of one- or two-word names.

Another of your correspondents, Michael Rayner, has suggested (*Brit. Birds*, 54: 332) that in the search for definitive bird names we should take to the scientific nomenclature. This is a subject on which I personally have become somewhat tender, since in the past I have been taken to task by various acquaintances for relying entirely on scientific names. May I suggest that in this matter we should adapt ourselves to our main public? Thus when writing for an international audience, or in a country with no fixed vernacular nomenclature, we should use scientific names, but when writing in a country with a reasonably stable vernacular nomenclature for a predominantly native audience we should keep to local names and abandon scientific ones altogether. Mr. Rayner tried to plead that scientific names are more precise and achieve a wider acceptance than well-established vernacular ones; but anyone who cares to inspect the successive incarnations of the British list since 1900 will discover that, owing to the infamous operations of the Law of Priority in Zoological Nomenclature, the opposite is the case. In the circumstances, surely it would be reasonable to abandon the more pedantic applications of the convention that we must always mention each species twice in two languages in all our publications? Anyone who fails to recognise a Rosy Pastor by any other name will find it in the *Nomina Avium Europaeorum* (1958) of my good friend Miss Harriet Jorgensen.

I should also like to take this opportunity to call attention to the

fact that some of the vernacular names used in current British lists for some of our rarer sea-bird vagrants disagree with those used in the only existing comprehensive international guide to the sea-birds of the world, W. B. Alexander's *Birds of the Ocean* (2nd ed., 1955) and virtually all non-European textbooks in English. I am not personally very anxious to see all our names altered to conform with foreign usage, because in some groups, notably the gulls, our names are very well established and often, as in the case of the black-headed gulls, simpler than those used by Alexander. (It seems a very good idea to restrict "Black-headed Gull" entirely to *Larus ridibundus*, and I am unable to visualise *Larus canus* turning into a "Mew Gull".) However, in the group in which I am particularly interested, the Procellariiformes, there are some marked discrepancies between British and foreign usage and, since most of the species concerned are relatively rare in Britain, it seems possible that it might be best for us to use the names which are popular in the normal range of the species concerned. In any case, I have recommended the following names for the forthcoming A.O.U. *Handbook of North American Birds*, and should also like to propose their use in this country:

1. *Names of families.* While the names "albatross" and "diving petrel" have always been restricted to the families Diomedidae and Pelecanoididae and so present no problem, there has been a gradual change over the course of time in the use of the terms "petrel" and "storm petrel" abroad and in the specialised literature. Thus "petrel" was originally applied to all members of the current families Procellariidae and Hydrobatidae when they were classified together, while "storm petrel" was at first applied solely to our own Storm Petrel (*Hydrobates pelagicus*). However, since the balance of opinion altered in favour of recognising the Hydrobatidae as a separate family the name "petrel" has tended to be applied unmodified only to the Procellariidae (fulmars, prions, gad-fly petrels and shearwaters), while there has been an increasing tendency to refer to all the Hydrobatidae as "storm petrels", as in Alexander's *Birds of the Ocean*. It might be a good idea if in this respect British authors were to follow Alexander and the people who deal regularly with the Hydrobatidae.

2. *Hydrobates pelagicus.* If all the Hydrobatidae are referred to as "storm petrels" this will involve little change in vernacular nomenclature in the case of Wilson's, Leach's or the Madeiran Storm Petrel, but it will lead to some ambiguity concerning the name of our commonest breeding species, now known simply as the "Storm Petrel". Although it is by no means confined to the British Isles, I suggest it would be a good idea if we were to follow Alexander and the English-speaking peoples who regularly meet the bird in South Africa, and call it the "British Storm Petrel".

3. *Pelagodroma marina.* When John Latham first saw a drawing of this bird he identified it as the indeterminable species *Procellaria fregata* Linnacus, and called it the "Frigate Petrel". Later, realising his mistake, he renamed it *Procellaria marina*, while the name *fregata* became associated with another group of storm petrels, the genus *Fregatta* of Bonaparte. Unfortunately, the name "Frigate Petrel" has stuck to *P. marina* in the English literature, though all the rest of the world calls it the

White-faced Storm Petrel. Surely after 171 years it is time we took note of Latham's correction, and adopted the name used elsewhere?

4. *Fulmarus glacialis*. I must confess to a personal preference for the old-established names "Fulmar Petrel" and "Silver-grey Petrel" for the northern and southern representatives of the genus *Fulmarus*, rather than the terms "Northern" and "Southern" or "Arctic" and "Antarctic" Fulmar coined by two recent authors. But possibly the latter are more convenient, if only because they make it possible to refer to the local form simply and briefly as "Fulmar" in either hemisphere without ambiguity. If so, "Northern" and "Southern" seem preferable to "Arctic" and "Antarctic" as qualifying adjectives since these are by no means exclusively birds of high latitudes.

5. *Procellaria diomedea* (= *Puffinus kuhlii*). This is still called the "Mediterranean Shearwater" in the 1955 edition of Alexander's book, though the B.O.U. has followed the Americans in referring to it as "Cory's Shearwater". It seems best to follow them, since their name appears to have at least as much priority as any other and does not commit us to a locality, while they also seem to see the species more often. South Africans may care to take note of the A.O.U. and B.O.U. decisions, since the main winter quarters seem to lie just off the Cape (*Ibis*, 97: 145; and I have now seen a considerable number of unpublished sight records).

6. *Procellaria assimilis* (= *Puffinus baroli*). Alexander called this the "Dusky Shearwater", a name applied by Latham to another indeterminable species and later given to this form and Audubon's Shearwater in the days before systematists were clever enough to distinguish between them. It seems doubtful if the recognition of two species is justifiable, since the birds of the Canaries and Cape Verde Islands show a progressive gradation between the two forms and there is less geographical variation in the group as a whole than in the species *Puffinus puffinus* (R. C. Murphy, *Amer. Mus. Novit.*, 276, 1586; C. A. Fleming and D. L. Serventy, *Emu*, 43: 113); in any case, taken alone or together these birds are little and not dusky, and I prefer to follow the Australasians in calling at least the cool-water populations "Little Shearwater" and accepting the name "*assimilis*" (*Emu*, 52: 222).

7. *The gad-fly petrels* (genus *Bulweria* = *Pterodroma*). Alexander amended *The Handbook's* name for *Bulweria basitata* to "Black-capped Petrel", and this is the one used in the *Field Guide*; the "black" seems rather unnecessary, however, and the local name in the West Indies, "Diablotin", is in any case simpler. I have recently examined the British specimen of the Kermadec Petrel (*Bulweria neglecta*) and it still looks like that species; there appears to be no disagreement about the vernacular name, and Alexander seems to be the only recent author to retain the scientific name *phillippii*. He first referred to *Bulweria leucoptera brevipes* as "Gould's Petrel" and then described it as the "Collared Petrel", the name used in the British literature; some other authors have called it the "White-winged Petrel". The collar is most inconspicuous, however, and the only evidence for the presence of much white on the wing in the field seems to be the scientific name *leucoptera*; at the breeding station in Australia the typical race is known as the Gould Petrel (*Emu*, 42: 143), so it might be as well to use this name. However, specialist opinion on the systematics of this group is still highly unstable, so we should perhaps wait until the scientific names have been settled before finding vernacular names for them.

W. R. P. BOURNE



29 NOV 1961

PURCHASED

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2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34. Various other conventions concerning references, including their use in the text, should be noted by consulting examples in this issue.

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British Birds

Vol. 54 Nos. 11-12

NOVEMBER-DECEMBER 1961



The vocabulary of the Great Tit

By Terry Gompertz

(Concluded from page 394)

Q. Song: repertoire development in individuals and populations

From the most cursory listening in any given locality, it is evident that there are certain types of songs—in particular those of two-note units—which appear to be in very general use. However, in many localities one or more of the less usual song types may also be prevalent for a certain period: for example, both in Hampstead and near Totteridge (Hertfordshire/Middlesex border), three-note songs in an uneven rhythm appeared in the repertoire of many individuals in 1958. Again, during the two months I spent in the North Riding of Yorkshire in the breeding season of 1961, three-note songs predominated in the repertoires of several individuals in the Howardian Hills and the North Yorkshire dales. As an example from a very different area in the Great Tit's range, Lehtonen (1954) described the typical song phrase in an area near Helsinki as a three-syllabic *ti-ti-tuu*.

The question of whether three-note songs (and/or more elaborate variants) predominate in any area—and whether the balance between them changes over a number of seasons—offers a tempting field for co-operative amateur research. Unlike most other elements in the vocabulary, this is one which does not require the use of recording apparatus or the observation of marked individuals—though these would be necessary for a further, more refined study—since an agreed method of transcription would give a good deal of useful information.

Only a detailed study, far beyond the scope of the unaided amateur, could produce conclusive answers to some questions. For instance, how does the development of song and of the song repertoire of individual Great Tits occur? And why are certain of the more complex songs common in particular areas and not in others at any given time?

Both these questions raise the fundamental issue of the rôles played by inheritance and learning in the development of the Great Tit's song.

In the course of the present study I have accumulated a little evidence which suggests that the songs making up the repertoire of an individual Great Tit *may* be found to be divided into two categories: (a) those conforming to a pattern which is either under genetic control or acquired during the short time the bird is within hearing of its male parent (or of other Great Tits with songs closely resembling those of its male parent); and (b) those conforming to a pattern set by some of the songs of other Great Tits with which it comes into competition during its first or subsequent song seasons.

I have found that first-year males, when beginning to sing, appear to behave very much as does a human who is picking out a tune by ear. That is to say, they seem to experiment, missing a beat here or putting in a note there, until there emerges a consistent pattern which appears to satisfy them. The pattern these first-year males "have in mind" does not necessarily approximate to any of the songs other Great Tits around them are singing. Thus, the young male may be working away at a three-note song, or a two-note song in a strongly dotted or march-like rhythm, while the other males in earshot are singing two-note songs in a gigue-like rhythm. The finished product, both in tone-quality and pattern, is often similar to songs in an area about three-quarters of a mile away and not heard in the space intervening. Later in the season, however, the repertoires of the same first-year birds include, in addition to their one or two "prototype songs", at least one very similar to that of a male with whom they hold a territorial boundary.

My own hand-reared male, most of whose *calls* were typical of our local population, developed two songs—both of three notes—which were somewhat unusual in tone-quality and quite unlike anything to be heard locally. This bird came from near central London at the age of four weeks, having been reared by humans after the age of ten days or so. One of his songs was closely similar, rhythmically, to a three-note song I have noted as common in north-west London. So hard did he "work" at these two songs, apparently disregarding the eleven different ones he could have imitated from his two immediate neighbours (not to mention several others within earshot) that I was forced to the conclusion that, for this bird, song *had* to be produced in a three-note pattern. This could either have been "remembered" from the first twenty-eight days of his life when he could have heard it from his father or another male, or else he could have "had to conform" to a pattern that was genetically controlled. Since this bird died on 17th April he would still have had ample time to extend his repertoire to include approximations to his neighbours' songs. Indeed, I was

inclined to think that various *sotto voce* utterances he started from mid-February onwards foreshadowed this development.

In the case of the Chaffinch, Thorpe (1958) found that the song repertoire was built up during the first singing season of the bird's life and that "it is almost impossible for a Chaffinch to learn any new songs or indeed to modify its old ones after it has reached the age of about thirteen months". Whether or not the Great Tit differs from the Chaffinch in this respect is a most interesting question.

R. *Special vocabulary of paired birds*

I have already mentioned two elements to be heard in the vocabulary of paired birds—"pee-churring" and a Magpie-like "chatter-churr". I am in some doubt, however, as to whether these do not also appear in the vocabulary of both adult males and females who are looking for mates. There are, however, some other calls and utterances which indicate quite clearly that a male or female is paired.

1. The "duple" call. I call it this partly because the word is an onomatopoeic rendering of the call unit, and partly because the call itself—which may be anything from five to nine notes—is based on a two-note pattern in a fairly strongly marked duple time (i.e. the beat or the bar is divided into two). A spectogram of a five-note "duple" call is shown in plate 61(e). "Duple" calls may sound fairly similar to song phrases, which may lead to confusion between the two since song phrases are also used in some of the situations described below; but in any individual repertoire that I have heard the calls are not, in fact, composed of units to be heard in any of the bird's songs. I think the "duple" call is far more closely related to the *pee* note social calls, being a more elaborate and stylised version of these. The call always includes some notes of a tone-quality highly characteristic of the individual uttering it.

When the "duple" call enters—or re-enters—the vocabulary of a male, it is an indication that he is paired and keeping very close company with the female. My hand-reared male first started using "duple" calls, on hearing me around first thing in the morning, as soon as my status had changed from that of a social companion (eliciting his various *pee* note social calls) to that of a mate. He did not use them at the sight of, or disappearance of, other members of the household who continued to elicit merely the social calls.

Typically, "duple" calls are given by the male when contact between the pair has been broken or when it is renewed again. For instance, a pair may have been feeding together and one or the other flies away; wherever the male is, he soon utters the call and if the female does not either follow or return to him he flies around, apparently in search of her and calling at intervals. Or the two may have been foraging in

different places and the male returns within the territory; if he does not then find the female he starts "duple" calling.

The "duple" call, among others, is also often used by the male during the winter if he is one of those individuals who enact a certain rather pleasant little evening ceremony. This involves him in accompanying his mate to her roost, then hopping around the site and sometimes peering into it after she has gone inside.

The female starts giving her version of the call at the time when she begins to take a more than passing interest in prospecting nest sites. When nest-building starts, the female Great Tit both gathers the material and builds the nest, and the male constantly uses the "duple" call while accompanying her. When she is laying and incubating he often uses it on arrival at the nest site to feed her, and when the young are hatched it is the usual call he makes as he comes with food for the nestlings. It is not surprising, therefore, to find that it is the "duple" call which is used by both parents to rally the members of their brood after fledging. Indeed, it is then uttered at the loudest one ever hears it from the female (an increase in volume which applies to all the calls she makes at that time). Certainly, by the time they fledge, young Great Tits must know this call of their parents. It has, after all, coincided with the arrival of food for the nineteen or more days since they were hatched.

Hinde stated that he found the different broods at Wytham were "mixed broods" by the end of a week or so after fledging time. This would seem to indicate that there is little value in any particular individual quality of the "duple" call, at least as far as keeping a brood together is concerned. But I have not found mixed broods of this sort in our locality. On the contrary, when three broods (all colour-ringed) have been visiting the garden together, the youngsters concerned have all flown towards their own parents when called. The individuality of the call is so clearly apparent to the human ear that I have used it to follow the travels of a particular brood in a wood where three or four broods have been on the move.

2. Female begging notes. These are aurally indistinguishable from the juvenile begging notes. A female will use them when she has got separated from the male. I have heard them from early February onwards, but they are most common just before the start of nest-building when they can sometimes startle one into the belief that a pair has broken the rules and bred before the oaks are in leaf. The begging notes are sometimes used by the female before soliciting for courtship feeding.

3. "Zeedling." This is the utterance truly associated with courtship feeding and copulation. Used by both males and females, it has been rendered by Hinde as *zeedle-zeedle-zeedle-zee*, which is a good

verbal representation of the *glissando*, squeaky quality of the notes. According to acoustic conditions, it may be audible up to distances of twenty yards or so. I have always found the version produced by the female of any pair to be lower in pitch than that of the male. The wings are vibrated rapidly during "zeedling" and the mandibles may be only slightly open, if at all. Whether it be to give or to receive courtship feeding, or for copulation, it is the soliciting bird which starts the "zeedling" and wing-shivering display. The other, if accepting the invitation, then joins in.

I am constantly amazed at the way a female, *en route* to the nest with food for the nestlings and at the same time importuning the male for courtship feeding, can "zeedle" for some minutes with a caterpillar hanging out of her mouth. The caterpillar does not appear to impair the quality of the sound at all! Indeed, the least unsatisfactory recording I have managed to make of "zeedling"—an extremely difficult sound to record adequately—was made by holding up the microphone to a female who, caterpillar in mouth, was perched on a low branch above me as I offered cheese to her mate. Subsequently she dropped the caterpillar and the male fed her with the cheese.

Whether or not a second brood is undertaken, the female may continue to "zeedle" and wing-shiver for courtship feeding after the young of the first brood fledges. The length of time for which she continues to do so varies, no doubt, according to her readiness to breed again.

4. Nest invitation call. This is a very intense, hissing type of utterance, which I first heard and recorded from my hand-reared male. He used it when trying to entice me into "nest" holes. When in the house, these "nest" holes might be the drawers of my desk, or the slightly open medicine cupboard in the bathroom. Outside, I was tactlessly invited to enter the residents' nest boxes.

One would not normally hear this sound unless one was almost on top of a nest hole during an invitation display. But by placing a microphone directly under the entrance to a wild bird's nest box, I satisfied myself that it was a normal element in the vocabulary.

SUMMARY OF ANALYSIS

The sounds or groups of sounds uttered by the Great Tit, as I have found them to be present, or absent, in the vocabularies of juveniles and adult females and males, are shown in Table 1. As one would expect from similar studies made of other species, this analysis shows that there are two elements common to juveniles and adult females which do not occur in the adult male repertoire; these are both associated with the bird being in a dependent or subordinate position. Similarly, five of the elements in the adult male vocabulary, which are

normally absent in those of adult females and juveniles, have a strong association with the acquisition or holding of territory.

TABLE 1.—ANALYSIS OF THE VOCABULARIES OF ADULT AND JUVENILE GREAT TITS (*Parus major*)

The sounds are listed in the order in which they are described in the ordinary text. N signifies normally present at appropriate seasons and E exceptionally present, while ? means possibly present and *a* absent

	Juvenile	Female paired	Female unpaired	Male paired	Male unpaired
1. Begging notes	N†	N	<i>a</i>	<i>a</i>	<i>a</i>
2. Early contact note	N	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
3. Random warble and "whispered quiet song"	N	N	N	N	N
4. "Intense quiet song"	N‡	<i>a</i>	<i>a</i>	N	N
5. <i>Tsee-ee</i> alarm call	N	N	N	N	N
6. Churring					
(1)	N	N	N	N	N
(2)	N	N	N	N	N
(3)	N	N	N	<i>a</i>	<i>a</i>
(4)	<i>a</i>	N	?	N	?
(5)	<i>a</i>	N	N	N	N
(6)	<i>a</i>	N	<i>a</i>	N	<i>a</i>
7. "Pits", "chits", "spicks", etc.	N	N	N	N	N
8. "Injury or distress" shriek	N	N	N	N	N
9. <i>Tsee, pee</i> and <i>pee</i> note calls	N	N	N	N	N
10. <i>Pee-tink</i> and variants	<i>a</i>	E	<i>a</i>	N	N
11. <i>Tink</i>	<i>a</i>	E	<i>a</i>	N	N
12. * <i>Pee</i> notes combined with other musical and non-musical sounds	<i>a</i>	<i>a</i>	<i>a</i>	N	N
13. *Vibrant <i>pee</i> note calls	<i>a</i>	<i>a</i>	<i>a</i>	N	?
14. "Muttered threat"	<i>a</i>	<i>a</i>	<i>a</i>	N	N
15. *Song	<i>a</i>	E	<i>a</i>	N	N
16. "Duple" calls	<i>a</i>	N	<i>a</i>	N	<i>a</i>
17. "Zeedling"	<i>a</i>	N	<i>a</i>	N	<i>a</i>
18. Nest invitation	<i>a</i>	<i>a</i>	<i>a</i>	N	<i>a</i>

* definite or probable local dialects † until independent ‡ perhaps male only

VOCABULARY OF AN INDIVIDUAL MALE

Since the adult male has the greatest range of calls it may be useful to indicate the number of easily distinguishable utterances one may hear in a single individual's repertoire. Table 2 illustrates this with the repertoire of a bird I have now heard and recorded during two full years. It is by no means so extensive as that of some male Great Tits.

If to the list in Table 2 one adds the *sotto voce* "spicks", "chits" and so on, with which the bird conducts a running commentary as it goes about its business, a typical adult male's vocabulary is seen to be quite

GREAT TIT VOCABULARY

TABLE 2—ANALYSIS OF THE REPERTOIRE OF AN INDIVIDUAL
MALE GREAT TIT (*Parus major*)

Thirty-two songs and calls are summarised below

"Quiet songs"	2
<i>Tsee</i> alarm call	1
Varieties of "churring"	5
<i>Tsee</i> , <i>pee</i> and <i>pee</i> -note calls	7
<i>Tink</i>	1
<i>Pee-tink</i> variants	4
<i>Pee</i> -notes combined with other musical and non-musical sounds ..	2
Vibrant <i>pee</i> -note calls	2
"Muttered threat" phrase	1
Songs	4
"Duple" call	1
"Zcedling"	1
Nest invitation call	1

extensive. In the case of such males as the one whose repertoire of seven songs has been illustrated in plate 60, the vocabulary is even larger. This individual constantly extends his vocabulary by adoption from his neighbours and by personal improvisation. Currently, I have logged forty distinguishable utterances from him (exclusive of "spicks", "pits", etc.). It may be that this extensive repertoire has some connection with the fact that a major part of his territory lies in that part of our ground which has been designedly provided with every kind of tit attraction—thus bringing more than the normal number of visitors and keeping them on the premises for longer than is usual in the other gardens near-by.

LOCAL DIALECTS

Against three of the categories of sounds listed in Table 1 I have placed an asterisk. It is within these categories that I know (nos. 12 and 15) or suspect (no. 13) that there are local dialects. By this I mean that certain calls or songs may be heard in one quite small area of, say, half a mile radius and not in another continuous with it. The dialect frontiers coincide with territorial boundaries.

Having only had the opportunity, until now, of studying Great Tit utterances extensively in a very limited area of Britain, I can offer no evidence as to whether or not the Great Tit dialect areas resemble those of the Chaffinch. With the Chaffinch, Marler found that similar dialects recurred in different parts of the country, and he wrote (1956c): "It is as though all the towns of Yorkshire had been scattered across Britain. Each would be readily distinguished from its immediate neighbours, but could not be distinguished by ear from similar 'dialects' elsewhere . . ."

From random listening in districts other than those which I have studied intensively, it is my impression that the "dialect" position of the Great Tit may prove to be somewhat similar to that of the Chaffinch. In other words, parts of the same dialects may recur in widely separated localities.

CONCLUSION

In this paper I have attempted to relate the vocabulary of the Great Tit to the behaviour which it accompanies. I have little doubt that my analysis is oversimplified and that it will need elaboration and revision in the light of a longer and more detailed study. However, in spite of its obvious shortcomings, I hope that it may prove of some use to those who feel, as I did when a foundling Great Tit came my way four years ago, that a common bird with so varied a vocabulary sounds a challenge which is hard to ignore.

NOTE ON TECHNICAL EQUIPMENT

All recordings were made on a "Ferrograph" Model 2A/N tape recorder at a speed of $7\frac{1}{2}$ inches per second. Originally one, and later three, moving coil microphones were used. These were S.T. & C. Type 4021 and the tape was Emitape 77. When three microphones were used a simple selector key was employed in order to switch from one to the other; there was no "mixing" of input. The use of three microphones greatly facilitated both the obtaining of a good signal from the same bird when it moved from one position to another and the recording or monitoring of sounds from other individuals.

The spectrograms were made on a sound-spectrograph designed by Dr. Peter Denes and constructed in the Phonetics Laboratory at University College, London.

ACKNOWLEDGEMENTS

I have already mentioned the help of my friend Rosemary E. Jellis with regard to devising a notation and transcribing and analysing the vocabulary. Apart from this, however, she has assisted in numerous other ways; she has helped with hand-rearing and ringing, and at every stage of the preparation of this paper.

The recording necessary for the study could not have been undertaken without the unstinted help and advice of an electrical engineer; for this I am most grateful to my friend A. R. Windsor. I am also greatly indebted to Professor Fry for his kindness in making spectrograms from my recordings and for a number of most helpful discussions.

I must also acknowledge, with thanks, a grant from the British Trust for Ornithology towards the cost of tapes for recording. I am

grateful for much encouragement, helpful discussion, information, advice or expert help to Dr. Bruce Campbell, Dr. J. D. Carthy, Mr. Stanley Cramp, Mr. Derek Goodwin, Dr. H. Lewis, Dr. B. Lofts, Dr. M. Lobban, Prof. A. J. Marshall, Mrs. Waller, Mr. H. White and Mr. J. J. Yealland. I should like to thank Sir Charles Harington, F.R.S., for allowing me access to, and recording facilities in, the grounds of the Medical Research Council Laboratories at Holly Hill, Hampstead. My thanks are also due to the owners of various properties on Pinner Hill, Middlesex, and at Brandsby, Yorkshire, for giving me the freedom of their grounds for observation and recording.

SUMMARY

(1) The author studied the vocabulary of the Great Tit (*Parus major*) over a period of four years. Calls and songs were tape-recorded from hand-reared birds (free-flying within an aviary and house) and colour-ringed wild birds whose activities and behaviour were under constant observation. Certain calls, and the full song repertoires of two males, were submitted to spectrographic analysis.

(2) The vocabulary is analysed and a classification made which relates the various sounds and calls to the types of behaviour with which they are associated.

(3) Of the eighteen main categories of sounds made by Great Tits, five associated chiefly with territorial behaviour are normally absent from both the juvenile and female vocabularies. Also absent from the juvenile vocabulary are four utterances used only by paired birds. A random "warbling" heard from juveniles is discussed. A similar utterance to juvenile "warbling" is one of the two types of "quiet song" described; the other has been heard only from juveniles and adult males.

(4) The relationship between the *tink* note (normally exclusive to adult males) and song is discussed, as is the exceptional occurrence of "tinking" and singing in females.

(5) It is usual for males to have at least four clearly distinguishable songs; the highest number of variants transcribed or recorded from an individual was seven. The significance of variation in song is discussed, as is also the manner in which an individual's repertoire may be built up.

(6) Individuals differ in the number of variants they use within certain of the main categories of sounds listed. A male with a very average vocabulary used thirty-two distinct utterances (not including the various *sotto voce* sounds made when foraging, examining holes, etc.); one with a more extensive vocabulary has forty distinct utterances in his present repertoire.

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Further observations on foot-movements in plovers and other birds

By K. E. L. Simmons

RECENTLY I DISCUSSED some aspects of the feeding behaviour of waders and other birds with particular reference to the foot-trembling of plovers (Simmons 1961). That paper has drawn in a number of further observations which the editors have asked me to summarise. In addition, a contribution on the function of the various foot-movements has been published separately (Sparks 1961).

I am indebted to the observers whose records are given below and to Dr. Kai Curry-Lindahl, J. B. Hulscher and K. G. Spencer for help with the literature. J. B. Hulscher drew my attention to Portielje's book (1938) which contains important information on foot-tapping and foot-paddling; this supersedes certain observations in Portielje's earlier paper (1922).

Among the observations received were several cases of "rushing", "bouncing", "jumping" and so on, but these other feeding movements are beyond the scope of this present summary.

FOOT-TREMBLING BY WADERS

The notes which follow should be read in conjunction with those already published in my earlier paper:

Lapwing (*Vanellus vanellus*). Foot-trembling discussed by Portielje (1938), with a photograph of a young bird performing.

Ringed Plover (*Charadrius hiaticula*). Foot-trembling confirmed by Dr. Kai Curry-Lindahl, who has observed it many times and recorded it in *Våra Fåglar i Norden* (1947 and 1960). He never saw the behaviour in the northern subspecies (*tundrae*) on the breeding grounds in Swedish Lapland, but did so several times on the shores of lakes and marshes in the Belgian Congo where this race winters. Another record comes

from L. Baird and F. R. Horrocks who saw several Ringed Plovers foot-trembling while feeding on mud at Astley Flash, Lancashire, in 1960—"lightly and rapidly tapping the mud and feeding or at least picking after each 'tremble' " (F. R. Horrocks *in litt.* to K. G. Spencer).

Little Ringed Plover (*Ch. dubius*). Information on this species included by Portielje (1938). Robert Gillmor has also observed and sketched Little Ringed Plovers foot-trembling on a number of occasions near Reading, Berkshire.

Golden Plover (*Ch. apricarius*). Foot-trembling "repeatedly very strongly suspected" by K. G. Spencer in birds feeding on upland pastures.

Dotterel (*Ch. morinellus*). Two observed by P. Carah near Lytham, Lancashire, between 28th April and 13th May 1959 (see also *Report on Birds, Lancashire, 1959*, p. 12):

The birds, two migrants on spring passage, were in fields of young oats on Marton Moss. While feeding, both habitually showed rapid, one-legged foot-trembling on the bare soil between the rows of seedlings.

Three-banded Plover (*Ch. tricollaris*). Observed several times in the Belgian Congo by Curry-Lindahl (1961) and in Madagascar by Milon (1951).

Black-tailed Godwit (*Limosa limosa*). Bernard King saw one foot-trembling as it stood in a shallow pool at Wyke Regis, Dorset, on 2nd October 1960:

The bird was standing in shallow water, the greatest depth of which could not have been more than six or seven inches. Because it was slightly lame, it found difficulty in retaining its balance when probing into the bottom of the pool with its bill. As an alternative method of feeding, it constantly used its damaged foot, the toes well expanded, to tap the surface of the water quickly; it also made the same movements at varying depths below the surface. The edible life thus disturbed was either slowly picked off the surface or sought at the lower depths. But it would not appear that this practice was solely due to the injury, as the bird occasionally used its undamaged foot for the same purpose.

That this foot-trembling was in no way abnormal is also shown by Portielje's (1938) observations. He described foot-tapping in this species and compared it with the similar behaviour of the Little Ringed Plover and Lapwing. In his book there is an excellent photograph by W. F. H. Schut, which clearly shows a Black-tailed Godwit foot-trembling: one leg is quite still, while the other is blurred by its rapid movement. Clearly, then, foot-trembling is not confined to the true plovers, as was formerly believed (Portielje 1922, Verwey 1926, Simmons 1961), but this is apparently the only other wader in which it has been recorded as yet.

FOOT-TREMBLING BY A PASSERINE

Foot-trembling has recently been authoritatively confirmed in American Hermit Thrushes (*Hylocichla guttata*) by Brackbill (1960) who observed it in eight out of nine individuals that he watched closely as they foraged on lawns. In this foot-quivering (as Brackbill termed it) any bird concerned would sometimes touch only the tops of the grass blades, but at other times it was clearly the ground that it was patting, its movements on occasion being so vigorous that its whole body shook.

FOOT-PADDLING

Two-footed paddling, as I mentioned in the previous paper, occurs in many scolapacine waders, gulls, ducks, geese, swans, flamingoes and herons. To this list should be added the terns, the behaviour having been observed in, for instance, Sandwich Terns (*Sterna sandvicensis*) by Boyle (1951).

Additional references to this behaviour in gulls are contained in the books of Portielje (1938) and Kirkman (1937). Portielje described it in the Herring Gull (*Larus argentatus*), and also in the Shelduck (*Tadorna tadorna*), with photographs of both species. Kirkman likened the foot-paddling of the Black-headed Gull (*L. ridibundus*) to similar movements used in nest-shaping. The former (which he called "pool-dancing") he recorded on the sea-shore when the birds were standing in the shallows left by the receding tide, noting that the "quickstepping little 'dance'" stirred up the mud and that the gull would then peck at the surface, backing so as to "bring the disturbed area within range". He also saw one bird dance in the shallow water of the lakeside near the gullery he was studying at Twigmoor and another on a "freshly upturned sod"; both "footed it in vain". Another species seen pool-dancing by Kirkman was the Laughing Gull (*L. atricilla*): he saw a pair at the London Zoo foot-paddling in a pool, pecking at the surface as they did so, and also making the same movements on the hard gravel floor of the aviary.

To the list of gulls recorded foot-paddling, Dr. Kai Curry-Lindahl (*in litt.*) adds the Grey-hooded Gull (*L. cirrocephalus*) which he observed in the Belgian Congo.

DISCUSSION

Sparks (1961) has argued convincingly (see also Swennen and van der Baan 1959) that foot-movements by gulls and other birds on the sea-shore (1) have little, if any, reference to polychaete worms and (2) are an adaptation "to exploit the properties of intertidal muddy sand, in order to expose or incite movement in any cryptic invertebrates of the intertidal zone".

It may certainly be conceded that the various foot-movements are "designed" to function in the intertidal zone and that the evidence that birds capture earthworms inland by such movements is largely speculative (though more work is needed before the theory is finally dismissed). However, Sparks's further argument that the performance of foot-movements on grassland and other firm ground is functionless, an example of the inadaptability of bird behaviour to unusual situations, is much less convincing—though not entirely without foundation for individual cases of apparently inappropriate foot-movements are certainly due to the "inflexible nature of the behaviour". This is highlighted by such extreme cases as the Laughing Gulls that paddled on the hard gravel floor of their aviary (Kirkman 1937) and the Little Ringed Plovers and Lapwings that foot-trembled on linoleum and wooden floors (Heinroths 1928). However, it is hard to believe that the frequent foot-movements of even such shore-loving birds as the Herring Gull and Common Gull (*L. canus*) are entirely functionless inland, for these species spend much time on meadows and other firm habitats and such useless actions would surely have been eliminated at such places by habituation. Still more does this argument apply to such species as the Lapwing, the Golden Plover and, especially, the Dotterel, while the behaviour of the Hermit Thrush sheds quite another light on the problem.

I believe that the various foot-movements mentioned may well function away from the inter-tidal zone in a similar (if reduced) way—by making camouflaged or otherwise hidden invertebrates move. Much more work is needed on the feeding methods of waders and other shorebirds.

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Studies of less familiar birds

115. Bonelli's Eagle

By *Antonio Cano and E. R. Parrinder**

Photographs by Antonio Cano, I. F. Keymer and E. R. Parrinder

(Plates 66-73)

BONELLI'S EAGLE (*Hieraëtus fasciatus*) is among the easiest to identify of the nine kinds of eagle which inhabit Europe. Like the Golden Eagle (*Aquila chrysaetos*), and unlike most of the others, it prefers barren hills and mountains, away from woods. It is considerably smaller than the Golden Eagle and has a much more active, dashing flight, stooping on its prey like a falcon. The adult is distinguishable from all other European eagles; from underneath by the contrast of the creamy white under-parts and dark wings and by the broad dark terminal band to the tail; from above by a whitish patch between the shoulders. This patch can often be picked out from a considerable distance and is sometimes visible when the bird is perched.

Immature birds are more difficult, as with all the eagles. Juveniles are dark brown above and reddish brown below with closely barred tails. Traces of the adult plumage begin to appear in the second year, when the breast becomes lighter and streaky, but the full adult plumage is apparently not assumed until the third year. Immature birds sometimes pair with adults and breed, according to Willoughby Verner (1909, *My Life among the Wild Birds in Spain*).

In Europe, Bonelli's Eagle breeds in Spain, the south of France and Italy, Greece and the larger Mediterranean islands. Outside Europe, the range extends eastwards through Turkey, Iraq and Iran to India and south-east Asia; the species is also found from Morocco to Tunisia and in many parts of Africa south of the Sahara. This eagle is not uncommon in Europe and it may seem surprising that so few photographs have been taken at the nest. One explanation is that many nesting sites are quite inaccessible for photography. In *Wild Spain* (1893), Abel Chapman and Walter Buck said that they had "only seen

*This text has been compiled by Parrinder, partly from his own observations and partly from extensive notes supplied by Cano and kindly translated from the Spanish by L. J. C. Southern.

its nest in the most stupendous rock walls—places that make one's flesh creep to survey". In those days, of course, egg-collecting and shooting were the fashion, rather than photography, and Chapman's description of his introduction to Bonelli's Eagle is horrifying to read now—"She was only forty yards away, yet the sitting shot (broad-side on) produced no effect. A 'green wire cartridge, No. 1' from the left, broke a wing as she rose, and, after some little trouble, she was secured." Verner remarked that when a Bonelli's Eagle flies off the nest it makes a rapid dive, quickly followed by a short upward curve, which makes it difficult to shoot! However, he claimed to have shot one only, although he visited many nests and evidently took, or helped others to take, many eggs. The majority of the nests which he found were on open ledges on rock cliffs, always near to the top of the cliff whether it was 50 or 500 feet high. Some were relatively easy of access and some almost impossible; when he asked Admiral Farquhar, another collector, what was the nastiest place he had ever been in when eagle nesting the reply was "that Bonelli's nest we took together".

The present series of photographs was taken near Almería, in the south of Spain. In February 1958 a male Bonelli's Eagle, which had been shot by a shepherd, was received at the laboratory of the Instituto de Aclimatación, in Almería. It was learnt that a pair of eagles, of which the dead male was one, had nested for many years in the Barranco de Tartala, a gorge in the rocky hills a few miles north-west of the town.

The gorge is some three miles long and runs down in the direction of the town, between rugged limestone cliffs. At the lower end is a smallholding with a patch of cultivation (olives, figs, vines and prickly pears) and then a shepherd's cottage, the last habitation. Farther up, the arid limestone cliffs rise up from each side of a watercourse which, it is said, has not flowed for more than fifteen years. The vegetation is sparse and xerophitic—esparto grass, a few cultivated almond and locust trees and a sprinkling of oleander bushes in the bottom of the gorge.

In the middle of March 1958 Cano and J. A. Valverde visited an old nest in the Barranco, but found it unoccupied. A few days later they discovered the eyrie belonging to the shot male, about two miles up the gorge. It was on an open ledge 70 feet above the base of a vertical rock bastion and about 250 feet above the floor of the gorge. The site commanded a wonderful view down the gorge to the town of Almería and the sea beyond (plate 69). Although the nest was on a vertical face, a narrow ledge ran from it, rounded a corner of the bastion and continued back to the main slope of the gorge. By climbing along this ledge, Cano and Valverde were able to reach the nesting site which was on a platform in the rock face about 3 feet 6 inches wide and 6 feet

6 inches long. On this platform was a bed of dry branches covered with broom and esparto to a total depth of about 10 inches at the front and $7\frac{1}{2}$ inches in the middle. Two chicks were in the nest, some seven or eight days old (plate 70a). The only food was a headless and partly eaten Ocellated Lizard (*Lacerta lepida*).

When Cano and Valverde returned a week later to erect a hide, they were told by a shepherd that the female had been seen flying with another bird which at first it fought but then appeared to accept as a new mate. This new adult did not appear to help with the feeding of the chicks. It seems, therefore, that the female continued to incubate the eggs after the death of the first male and later undertook the whole of the feeding.

There was no place on the ledge, or elsewhere, for a normal hide for photography so a wooden platform was constructed and suspended on wires from pitons driven into the rocks above (plate 68b). On 28th March, Cano added a triangular tent hide to this enterprising contraption (plate 68 inset) and two days later he returned to take plates 66 and 73. He reached the nest site at 10.40 a.m. and, on rounding the corner of the approach ledge to enter the hide, saw that the female was feeding the chicks. He was able to retreat round the corner without being seen and stayed there until the bird left, forty minutes later. She was away for eighty-five minutes, then returned with a live lizard and stayed at the nest for sixty-five minutes. One of the chicks was noticeably larger than the other and its crop was still full from the previous feed. The female first fed this chick, and then spent most of the rest of her time attending to the weaker chick, whose crop appeared empty. She showed a particular devotion towards it, tearing the lizard into small pieces and introducing them with great care into its bill (plate 66).

Six days after this, on 4th April, Cano was told by a shepherd that the nest had been destroyed furtively by some men out shooting. When he went to the nest again later, to collect the hide and platform, he found remains of the chicks on the nest.

Cano and Valverde did not visit the Barranco de Tartala in 1959. In 1960, however, M. D. England wrote to them to make arrangements for an expedition to Almería and included Bonelli's Eagle on a list of birds he would like to photograph. Cano went to the Barranco on 6th May and climbed up to the nest; he found two well-developed chicks which he judged to be about three months old (plate 70c). Four days later, Cano and Valverde accompanied England and other members of his party to the Barranco, and Cano climbed along the approach ledge to the nest. When he returned it was evident that something had gone wrong; he reported that the nest was empty and that the chicks had disappeared.

Next day, a message was received at the Instituto de Aclimatación that the chicks were alive and in Almería. The following morning they were taken to the Instituto where they were found to be very weak and obviously not far from death. However, they were forcibly fed with beef and revived sufficiently for Cano to take them back to the nest on the 13th. Two days later, Cano visited the eyrie and disturbed an adult feeding the chicks; their crops were full and there were lizard remains in the nest—the beef which Cano had left was untouched. The chicks had been away from the nest for at least four days, probably longer, and it is remarkable that the adults should remain around and accept them back so readily when they were returned.

On 18th May, with the help of his brother Fernando and I. F. Keymer, Cano erected the platform which had been used at the same nest in 1958. At first it was left hanging down, so as to get the adults used to it (plates 67 and 68a). Two days later, the platform was lowered and the triangular hide put on to it. As it was being fixed, an adult came in close to the eyrie, carrying a large lizard in its talons. On seeing humans, it fled and dropped the lizard which fell to the floor of the gorge with a resounding crash. When the eagle reached the other side of the valley it started to call, a loud, drawn-out whistling note, and continued to call for several minutes. Then it reappeared with the other adult and both came towards the eyrie, calling, as if intending to attack the intruders; at that moment, a Golden Eagle flew in front of them and both of the Bonelli's swerved off course and attacked it instead, following it out of sight.

Parrinder climbed along the ledge on 23rd May. Although aided by a rope belayed by Cano, he was miserably aware of the possibility of a 70-foot sheer drop followed by a 200-foot roll down the scree slopes below. Crouching inside the hide gave only a temporary feeling of security; the suspended platform sloped slightly, there was nothing to hold on to and the valley below was clearly visible through gaps in the wooden floor. But all this was forgotten when, only fifteen minutes after Cano and the others were out of sight, an adult Bonelli's Eagle arrived at the nest carrying a large green lizard (plate 71a). The lizard was torn up and fed to the young in just over twelve minutes; the eagle then flopped up to the end of the nest, about two feet from the watcher's eye, rubbed its bill against the sticks and left.

While the adult was there, the chicks kept up a thin, plaintive cheeping, but after it had left they soon quietened down and went to sleep. In the two weeks since they had been in Almería they had grown considerably and become much more feathered. They were, in fact, almost in juvenile plumage; their heads were still white, with brown flecks, and each still had a patch of down on the lower breast and another in the middle of the back.

Keymer went into the hide on 25th May (plate 71b) and Cano, to take a film, two days later. On both occasions the only food brought was lizard. Cano and Valverde carefully examined the remains scattered around the nest on all their visits to this site. Once only did they find the hindquarters of a young Rabbit (*Oryctolagus cuniculus*) and once two feathers of a Red-legged Partridge (*Alectoris rufa*) with some of Blue Rock Thrush (*Monticola solitarius*) and pigeon (*Columba* sp.). All the other remains seen, and food brought, consisted of the lizard *Lacerta lepida* (plate 72b).

This predilection for lizards seems to be unusual for Bonelli's Eagle. P. Géroutet (1947, *Les Rapaces*) gave the food as Rabbits, Hares (*Lepus europaeus*) and other small mammals and birds, especially water-birds. This diet is confirmed by both Chapman and Verner. Verner took a young Bonelli's Eagle from a Spanish eyrie and brought it back to England; he stated that its favourite food was Rabbits or rats (*Rattus* sp.). Although Bonelli's is a relatively small eagle, it is immensely strong. Abel Chapman saw one take a Ruddy Shelduck (*Casarca ferruginea*)—"this eagle was in the act of lifting the heavy duck off the water when a charge of big shot cut him down". In *Pirates and Predators* (1959), Colonel R. Meinertzhagen related seeing a Bonelli's Eagle fly off with a Houbara Bustard (*Chlamydotis undulata*), a bird of about its own weight. Chapman, in *Unexplored Spain* (1910), went so far as to state flatly that Bonelli's Eagle does not take snakes or big lizards. He tried to persuade a Spanish gamekeeper that they did, in order to distract his attention from the Rabbits and Red-legged Partridges which a particular Bonelli's was extracting from a preserved area. The unbelieving reply was "Si, Señör, y los insectos"!

J. A. Valverde (*in litt.*) tells me that he found numerous remains of *Lacerta lepida* at a Bonelli's Eagle eyrie at Novelda, Alicante, in 1955. This eyrie was also in an extremely dry area and Valverde regards the taking of these lizards as an adaptation to semi-desert habitats; he refers to a statement of Heim de Balsac (1954, *Alanda*, 22: 3) that Golden Eagles are particularly fond of another lizard, the slightly larger *Uromastix acanthinurus*, in the very dry regions of the Sahara. There can be little doubt, however, that another factor in the Barranco de Tartala was the advent of myxomatosis, which almost wiped out the Rabbit population. There are still a few left, but their numbers are greatly reduced. On the other hand, Red-legged Partridges are abundant and they are a traditional food of Bonelli's Eagle (whose Spanish name is, indeed, "Águila Perdicera").

Despite their harmless diet, the Barranco de Tartala eagles are clearly unpopular with the local shepherds and shooters: when Cano returned once more to the nest on 3rd June 1960, he found that it had been burnt and the young presumably destroyed, as in 1958. Valverde reports

that in 1961 the eyrie was located in a wall of rock opposite to the old nest; this site was more difficult of access, but it was nevertheless also burnt by poachers, probably before the young had hatched. The persecution of Bonelli's Eagle is nothing new—Verner remarked that “they have a great liking for the domestic fowl and owing to this and their alleged depredations on the very young kids they are much disliked by the peasants.”

Notes

Little Grebes attacking Coots and domestic ducks.—Although *The Handbook* describes the Great Crested Grebe (*Podiceps cristatus*) as “sometimes aggressive towards other birds”, we have been unable to trace any record of similar behaviour by Little Grebes (*P. ruficollis*). An observation which we repeatedly made while watching a pair of Little Grebes from 26th to 30th June 1961, on a small tarn near Windermere, Westmorland, may therefore be of interest. Their nest (with eggs) was in a completely open site among pondweed, and near the middle of the lake which is about three acres in extent. Three Coots (*Fulica atra*) were also established on the water (two of these had had a nest but a predator had taken their eggs). What happened was that one or the other of the Little Grebes would dive when five to ten yards from any of the Coots and, after a second or two, the Coot concerned would suddenly erupt from the water and scutter rapidly away with loud squawks. Once, when the off-duty grebe was returning to the nest, a couple of white domestic ducks (*Anas* sp.), which had been dabbling near-by for about two hours, reacted in a similarly violent way after the grebe dived near them. On every occasion the sudden departure of the Coot (or duck) was instantly followed by the surfacing of the Little Grebe exactly where the other bird had been. There is no doubt in our minds that the grebes were attacking underwater. All the incidents involving Coots took place at least fifty yards from the grebes' nest, but the ducks were attacked when only about ten yards away.

J. B. and S. BOTTOMLEY

Early sexual maturity in Mallard.—Four abandoned duckling Mallard (*Anas platyrhynchos*) were rescued in the grounds of the Wild-fowl Trust at Slimbridge, Gloucestershire, in November 1960. The first was found on the 7th and weighed 33 gm., the second was brought in on the 11th and scaled 43 gm., and the last two, on the 21st, were 51 and 53 gm. Newly hatched Mallard at Slimbridge commonly weigh about 35 gm., though there is considerable variation among individuals and between clutches. All the ducklings came from the same pen and it is possible that they formed part of a single brood.

There were two males and two females. They were hand-reared indoors and on 6th February were put into a metabolism cage for digestibility trials with various foods. The floor of this cage was of small gauge weld-mesh, nine foot square, and water and food were available only in troughs. With the exception of short periods in February and March, the ducks were caged until the summer.

On 11th June 1961, when they were seven months old, an egg was found in the cage and on the following day two more; the birds continued to lay at this rate until 2nd July, by which time twenty-six eggs had been produced. All were placed in an incubator and later examined for fertility. Thirteen showed signs of development. Probably these came from both the females as, in one case, two eggs of rather different shape and laid on the same day were fertile. Obviously the males were able to "tread" successfully in the unusual circumstances, although a 50% fertility rate is low.

It is generally assumed that a wild duck will not normally reproduce until about a year after hatching, although certain domestic breeds are expected to lay eggs at only four to four and a half months old. However, Hugh Boyd (*Brit. Birds*, 50: 302-303) recorded the apparent sexual maturity of a female Mallard in October, at an age of five months, under "wild" conditions. He suggested that late autumn broods, quite common in this species, might be the offspring of juveniles, rather than of adults that had bred or attempted to breed earlier. The now established fact that these late ducklings, of both sexes, are capable of reproduction in the following spring suggests that, in certain circumstances, Mallard may produce two generations in one year.

JANET KEAR

In her last paragraph Dr. Kear is contrasting domestic and wild ducks, but Mr. Derek Goodwin points out that other families of birds breed in the wild when much less than a year old. In Europe one assumes that birds do not breed until at least the following spring because conditions usually prevent the rearing of young in winter, but some species in other parts of the world—for example, Zebra Finches (*Taeniopygia castanotis*) in Australia—are known to breed when only about two months old if the conditions are favourable. Mr. Goodwin adds that he does not have much doubt that many tropical species, at least estrildines and pigeons, will breed in the wild when they are less than a year old.—Eds.]

Unusual behaviour of Marsh Harriers.—On reading Mr. Bernard King's recent note on unusual feeding behaviour of Marsh Harriers (*Circus aeruginosus*) (*Brit. Birds*, 54: 161), I was interested to see how similar his observations were to some which I also made at Minsmere,

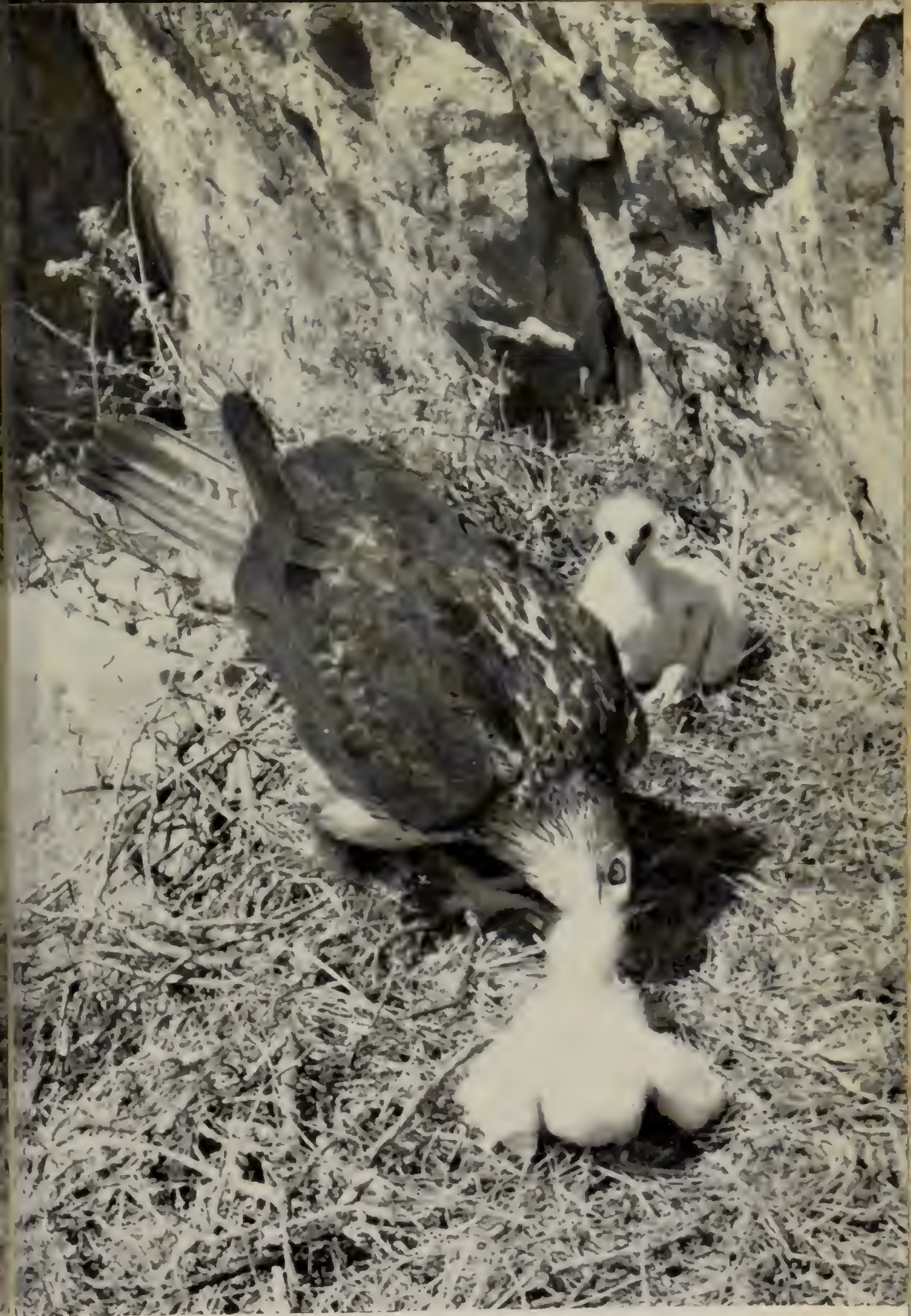
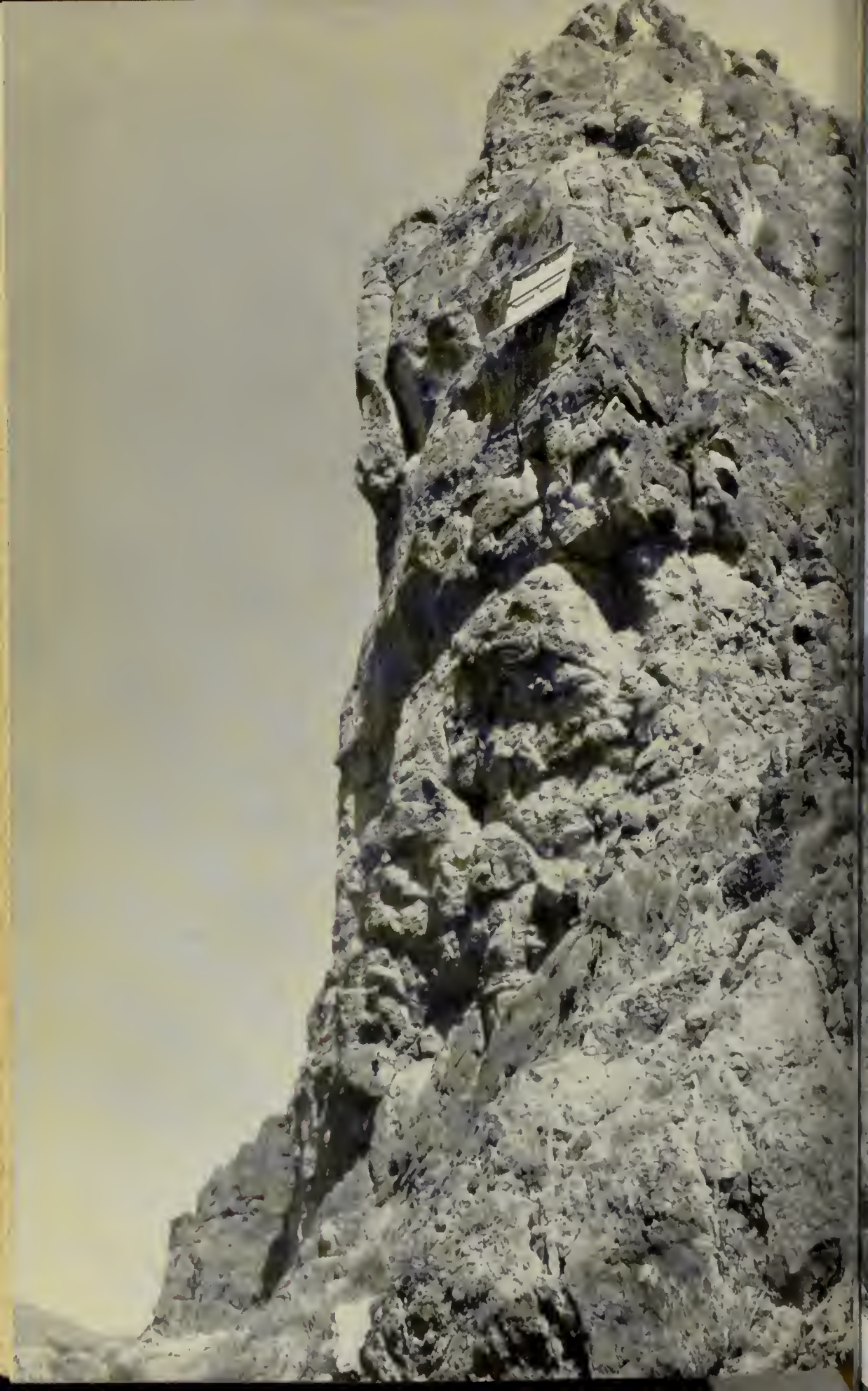


PLATE 66. Adult female Bonelli's Eagle (*Hieraeetus fasciatus*) feeding young 23-24 days old, Spain, March 1958. Note the dark end to the tail and the whitish area on the back. The nearer chick was weaker and was always fed after the other, but for a longer time and with great care (pages 422-427) (photo: Antonio Cano)



PLATES 67 and 68. Nest-site of Bonelli's Eagle (*Hieraetus fasciatus*), Spain, 1958 and 1960. The nest was on a ledge 40 inches wide and 80 long to the left of the upper edge of the platform in plate 67. There was a sheer drop of about 70 feet below and then a steep scree slope of 200 feet to the floor of the valley. The platform had one edge resting on a ledge 4-12 inches wide. The outer edge was supported by wires. A triangular hide (*inset*) was finally put in position (page 425) (*photos: I. F. Keymer and, below, Antonio Cano*)



PLATE 69 (*right*). Habitat of Bonelli's Eagle (*Hieraëtus fasciatus*), Spain, 1958 and 1960. The nest in these photographs was 965 feet above sea level and faced south. This is the view from the nest down the valley to Almería, with the sea in the distance. It is a terrain of rugged limestone with scant vegetation, few mammals, many lizards and snakes, and a limited variety of birds. Esparto is widespread, but most of the vegetation is growing on a dry river bed. The bushes in the foreground are oleanders; beyond can be seen various almonds, locust trees and prickly pears (*photo: I. F. Keymer*)



PLATE 70 (*below*). Young Bonelli's Eagles (*Hieraëtus fasciatus*), Spain, 1958 and 1960. Their ages in the three photos are 7-8 days, 23-24 days and 3 months. At 7-8 days they were nearly six inches long and their down was dirty white with a slight smokiness round the eye and on the crown, back and wings; their beaks were black shading to greenish-yellow at the base, with the cutting edges and cere yellow like their feet. By three months the brown feathers were coming through; the chicks in this third photograph are the 1960 ones which were later stolen but replaced (page 425) (*photos: Antonio Cano*)







PLATE 71. Bonelli's Eagles (*Hieraetus fasciatus*), Spain, May 1960. Above, ten days after the young were replaced (page 425) (photo: E. R. Parrinder). Below, two days later, the chicks now much more fully feathered than in plate 70c taken 19 days earlier; they are watching the other parent overhead (photo: I. F. Keymer)





PLATE 72. Above, a striking study of a young Bonelli's Eagle (*Hieraetus fasciatus*) five months old, Spain. Below, remains of Ocellated Lizards (*Lacerta lepida*) in the nest: a tail and two skulls and one still alive despite large side wounds; these eagles fed very largely on lizards (page 426) (photos: Antonio Cano)





PLATE 73. Adult female Bonelli's Eagle (*Hieraetus fasciatus*), Spain, March 1958. Note the contrast between the darkish brown upper-parts, paler on the nape, and the silky white under-parts which are finely streaked. Made of dry branches, lined with broom and esparto, this nest was 7-10 inches deep (photo: Antonio Cano)



Suffolk. On 14th July 1960, in the late afternoon, there were five Marsh Harriers close together in a rough grass field at the edge of the marsh. Two of them, a female and a juvenile, were perched on a small bush throughout the half-hour I was watching, while the other three, all juveniles, remained on the ground. From time to time these three flapped their wings vigorously and made short bounds which carried them a foot or so into the air and a short distance forward; on landing they occasionally performed another hop and came down with wings spread in a rather ungainly fashion. At first I thought that the actions were wing exercises, but after a time I became convinced that the birds were trying to hop on to something which was present in the grass, though it should be added that they did not appear to pick anything up from the ground. The actions and the bounding quality of each hop called to mind the hunting technique used by Foxes (*Vulpes vulpes*) trying to catch small rodents or large insects.

T. M. CLEGG

Coots eating acorns.—The recent references to Black-headed Gulls (*Larus ridibundus*) eating acorns (*Brit. Birds*, 54: 118, 130-131) have prompted me to record some observations I made on a group of Coots (*Fulica atra*) on Windermere, Westmorland, on 18th February 1956. Flocks of several hundred of these birds regularly winter there from October to March, and about ten were diving in Parsonage Bay that day. At this point a number of oak trees overhang the lake and there were many broken acorns, split by the weather, lying in one to three feet of water just off-shore. The Coots were ten or twenty yards from me, but through binoculars I could see that they were picking up and swallowing these split acorns.

ALAN F. AIREY

Apparent distraction display of Common Gull.—On 16th August 1961, while in Finnmark, Norway, with the University College of Swansea Oksfjord Expedition, I witnessed what seemed to be a distraction display by one of a pair of Common Gulls (*Larus canus*) at Sandland. This pair apparently had young hidden in the vegetation on the edge of a shallow lake about two hundred yards from the rest of the colony. The displaying bird glided downwind for about fifty yards at a height of less than a foot above the water, passing close to me and occasionally allowing its trailing feet to touch the water. At the end of the glide, it landed breast first on the water, bouncing several times before swimming jerkily away with its head held well forward near the water. It repeated this display noiselessly several times while its mate circled calling.

M. P. HARRIS

Gulls and Arctic Skuas feeding on berries.—During August 1961, when in Finnmark, Norway, with the University College of Swansea Øksfjord Expedition, I visited a mixed colony of breeding Common Gulls (*Larus canus*), Lesser Black-backed Gulls (*L. fuscus*) and Arctic Skuas (*Stercorarius parasiticus*) on the island of Loppa. Adults and young of all three species were feeding on the whinberries (*Vaccinium*) and crowberries (*Empetrum*) which were growing profusely in the area. The gulls were picking the berries with the tips of their bills, but the Arctic Skuas were gripping them with their heads tilted and then twisting them off the stalks. The adult skuas also often fed their free-flying young with small unidentified particles which I thought were these berries.

M. P. HARRIS

Kingfisher hovering and taking insects in the air.—On 16th July 1961, at Eye Brook Reservoir, Leicestershire, E. Pell and I watched a Kingfisher (*Alcedo atthis*) hovering over a small area of long grass, rushes and sedge. From this hovering position, it was hawking flying insects after the manner of a Spotted Flycatcher (*Muscicapa striata*). *The Handbook* refers to hovering over water and to the taking of aquatic insects, but we can find no mention of Kingfishers feeding on flying insects in this way.

N. L. HODSON

Passerines feeding on sandhoppers.—Bryan L. Sage's recent note (*Brit. Birds*, 54: 246-247) reminds me that I have occasionally seen Passerine species taking sandhoppers (*Talitrus locustra*) from the tide-wrack in the bays of the Gower Peninsula, Glamorgan, always in June, July or August. Jackdaws (*Corvus monedula*) are the birds most often involved and I have watched a group of as many as forty feeding in this way. I have also noted small parties of Rooks (*C. frugilegus*) a few times, and a Raven (*C. corax*) and a Rock Pipit (*Anthus spinoletta*) once each. On another occasion, a Pied Wagtail (*Motacilla alba*) caught a sandhopper, but immediately dropped it.

H. DICKINSON

Swallows associating with Starlings to feed.—At about 5.0 p.m. on 21st August 1961, near Belmullet, Co. Mayo, a flock of 80-100 Starlings (*Sturnus vulgaris*) flew past me, with about 40 Swallows (*Hirundo rustica*) in close attendance. A few minutes later I came across the Starlings feeding in the grass, and saw that all the Swallows were flying very close to the ground, directly over them. For the next fifteen minutes I watched the progress of the Starlings and they were always followed closely by the Swallows, even when they flew a short distance. What were presumably the same birds were still behaving in this way when I passed the place again at 5.55 p.m. The day was stormy, with strong westerly winds, and I concluded that the Swallows,

finding food scarce, were feeding on insects disturbed from the grass by the Starlings.

This seems to be parallel to H. G. Alexander's observation of a Swallow which persistently followed him to catch the insects he disturbed from the ground (*Brit. Birds*, 52: 164).

JOHN R. WHITELEGG

Preening in flight.—In Essex I have often observed Sand Martins (*Riparia riparia*) preening in the air in a similar manner to that portrayed by D. I. M. Wallace for Swifts (*Apus apus*) (*Brit. Birds*, 54: 323-324). Furthermore, when newly ringed Sand Martins are released, they usually peck at the ring for a second or two on laterally extended wings. Some go into a shallow dive as they attack the ring and so do not lose their stability, but others hold their wings obliquely downwards until they pitch backwards and finally stall.

JOHN H. SPARKS

Aerobatic behaviour of Rooks in a thermal.—On 1st July 1961, at Marham, Norfolk, I observed a flock of Rooks (*Corvus frugilegus*) soaring in a column of warm air rising over flat grassland. The thermal was a strong one and the birds ascended very quickly. At length, when the highest birds were about 200 feet up, I saw one Rook at the top of the flock turn completely over and descend vigorously in a spin. It was rolling through 360 degrees and continued to do so until only a few feet from the ground. Others then began to do the same, all starting from the culmination of the thermal and spinning downwards. As an aviator I have some experience of thermal flying and I have also heard of glider pilots getting out of a vigorous cumulonimbus cloud by side-slipping and spinning. These birds certainly knew their technique.

DAVID WRIGHT

Sex counts of Blackbirds on passage.—As the summaries by L. S. V. and U. M. Venables (*Ibis*, 94: 636-653; *Brit. Birds*, 54: 120-121) and J. H. Phillips (*Brit. Birds*, 54: 277-282) have indicated a preponderance of male Blackbirds (*Turdus merula*) in wintering areas in Britain, I should like to record the following observations made on spring passage.

In the early morning of 4th April 1960, a heavy fall of thrushes and Starlings (*Sturnus vulgaris*) occurred on the Calf of Man, an island of about one square mile lying to the south-west of the Isle of Man. The last birds to arrive, just after dawn, were seen to come from the south-west; it thus seems probable that the migrants had wintered in Ireland and were returning to the Continent. At least 2,000 Blackbirds were estimated on 4th April and many stayed until the 7th. A

number were trapped with mist-nets on the 4th and 6th, and there have been subsequent recoveries from breeding areas in Denmark and southern Scandinavia. Of 139 Blackbirds caught on the 4th, only 41 (29.5%) were males; of 66 caught on the 6th, 19 (28.8%) were males. Nets were scattered widely over the island, so the samples are good indications of the percentage composition of the migrant flock.

P. R. EVANS

[We have received a number of notes on sex ratios of wintering Blackbirds as a result of the summaries referred to in the first paragraph above. Most of these do not merit publication on their own, however, because they are not statistically adequate to extend the conclusions put forward by Mr. and Mrs. Venables and Mr. Phillips; some of them also lump together the observations of different years and months. It is clear that there is a most interesting field for research by ringers here, but it needs to be carried out on a sufficiently large scale to produce satisfactory results. We are publishing the present note by Dr. Evans because it draws attention to a separate subject—the differential timing of migration in the two sexes. Here also there is scope for detailed analysis of the data from the bird observatories' files.—EDS.]

Robin building second nest before departure of first brood.—In May 1956 a pair of Robins (*Erithacus rubecula*) built a nest in an old watering-can hanging on the outside of a shed in my garden at Tadworth, Surrey. The young left this nest on or about 14th June, on which day the first egg was laid in a second nest that had been started inside the shed about the 7th. The nests were only two feet apart and obviously belonged to the same pair, as there were no other Robins holding territory in that particular part of the garden. The construction of a second nest before the fledging of the first brood must surely be very exceptional.

HOWARD BENTHAM

[This is an unusually striking and well documented case of something which probably happens more frequently than Mr. Bentham suspects. We referred this note to Dr. David Lack, as he only touched on the subject in his *The Life of the Robin* (1943, pp. 92-93), and he did not know of any other record of a second nest being begun as much as a week before the departure of the first brood.—EDS.]

Notes on the incubation of the Grey Wagtail.—In a contribution to *Festschrift von Erwin Stresemann* (Heidelberg, 1949) entitled "The African Mountain Wagtail *Motacilla clara* at the nest", R. E. Moreau drew attention to the lack of comparable studies of the closely related Grey Wagtail (*M. cinerea*). Since this lack has still not been remedied,

I think I should put on record some observations which I made near Malmesbury, Wiltshire, in 1957. The site is a moat surrounding a house on an island of about an acre and a quarter; it is in the midst of farmland and distant a quarter of a mile from the Bristol Avon. The birds are present throughout the year, except in severe weather when the moat is frozen.

In 1957, Grey Wagtails were about at the beginning of March and on the 10th three were seen chasing together, presumably in some form of territorial contest. On 4th April, I found the nest in the dry stone wall of the moat, about two feet above the water (and a foot or so below ground level), on the side facing south-west. The water here is always still and not affected by the sluice which there is in the south-east corner. The nest appeared to be complete, but there were no eggs. The first egg was probably laid on the 7th and incubation began with the completion of the clutch of five on the 11th. On the afternoon of the 22nd three of the eggs were taken, possibly by a Grass Snake (*Natrix natrix*), and the birds deserted. By then, however, I had made detailed observations on nine of the twelve days of incubation.

Both parents took part in incubation, turn and turn about, and the hen roosted on the nest. The cock was recorded on the eggs for periods of from 20 to 68 minutes at a stretch, the hen for periods of from 20 to 90 minutes. The longest time for which the eggs were left uncovered was 18 minutes, but this was exceptional and usually one bird relieved the other at the nest, or within a minute or two. According to *The Handbook*, incubation is "performed by hen as a rule, but male also takes some part" and, unless the behaviour of my pair was atypical, this seems to me to need some modification. In *M. clara*, according to Moreau, "the share of the male (in incubation) is considerable". He also found that "it was unusual for the eggs to be left uncovered for longer than a quarter of an hour". My observations on the Grey Wagtail suggest that its behaviour in these respects is similar.

E. J. M. BUXTON

House Sparrows breeding in thrushes' nests.—In a small rural area at Porton, near Salisbury, Wiltshire, the House Sparrow (*Passer domesticus*) is the most numerous breeding species. Most nests are in the roofs of farm buildings, in trees (15-20 feet above the ground), in thick hawthorn hedges (often as little as five feet from the ground), or in ivy, but in 1961 we also had three cases of House Sparrows breeding in the nests of other birds.

The first was in the nest of a Song Thrush (*Turdus philomelos*). This was about three feet from the ground in an isolated hawthorn bush and a brood of four Song Thrushes had left it on 3rd May. On the

18th we flushed a female House Sparrow from the nest, which had been roofed and lined with feathers. There were four eggs, one of which did not hatch, and three young left the nest by 13th June. The same or another pair of House Sparrows were often at the nest in the next four weeks and on 11th July it was found that the original entrance had been closed and a new one made. There were three eggs again, but these did not hatch and the nest was later abandoned.

The other two instances involved nests of Blackbirds (*T. merula*). One pair of Blackbirds had built during April, again in an isolated hawthorn bush and about four feet from the ground, but had laid no eggs. House Sparrows were often at this nest in May and by the 18th a very thin dome had been built. This was gradually reinforced, until by 6th July the nest was well-roofed and lined with feathers. There were three eggs on the 10th and all hatched. The last nest was in a Swedish beam at a height of about 12 feet and the Blackbirds had three eggs in it on 6th June. On the 13th the nest was empty, but a pair of House Sparrows were in occupation and were regularly present thereafter. On 12th July the nest contained three young House Sparrows and an unhatched egg, but it was blown down in a gale that night. This nest had been lined with feathers, but there was no roof.

A. A. DUNTHORN and F. P. ERRINGTON

Reviews

Bird-Song. By W. H. Thorpe. (Cambridge Monographs in Experimental Biology no. 12). Cambridge University Press, London, 1961. xii+143 pages; text-figures. 20s.

For many years ornithologists have had painstakingly to try to convert bird songs and calls into mnemonic jingles, rhymes, words and phrases derived from human speech. These have all necessarily been highly subjective and, although they possess a certain value for their authors, they are unsatisfactory as descriptions for other observers. Many attempts have also been made to show the characteristics of bird song by ordinary musical notation, but, although this can be used where the songs have both a simple pattern and a more or less pure intonation, it is an unsuitable technique for high-pitched sounds of fluctuating frequencies and for the rhythms of many bird noises. The growth of tape recording and the invention of the sound spectrograph, which by a series of filters analyses bird-utterances and produces a delicately shaded graphic representation of frequency, loudness and duration, have provided two incomparable tools for the research worker.

Dr. Thorpe, with the assistance of Dr. Peter Marler who worked at Cambridge with him from 1952 to 1957, has made a fascinating and

rewarding use of the sound spectrograph to examine some of the many problems associated with bird songs and calls. Not only has he made many recordings himself of birds under experimental conditions, but he has been able to draw upon the large reservoir of recorded material in the B.B.C.'s library of recordings as well as from the large collection at Cornell University in the United States.

This book is the logical successor to a number of stimulating scientific papers that Dr. Thorpe has produced in recent years. It examines in considerable detail and with much clarity of exposition the supposed differences between animal language and human speech and it is interesting to note on page 11 that "human speech is unique only in the way in which it combines attributes which in themselves are not peculiar to man but are found also in more than one group of animals". There is a very full discussion on the function of call-notes; it would seem that among those Passerines whose vocabularies have been well studied the number of basic call-notes averages about fifteen, which suggests that this is the number of main items of information to be conveyed. Incidentally, I have found that among mammals the Badger has thirteen basic calls used in a similar way to those of some of the Passerines.

Much of the rest of this instructive book is devoted to the characteristics of song, as well as to the internal and external factors which control its seasonal and daily periodicity. Song also tends to be given in the absence of the female; even to the bachelor ornithologist it may come as a surprise to read that a Red-eyed Vireo uttered nearly 22,200 songs in the course of a single day! Sub-song is also discussed and there are chapters on the development of song in the individual, on specific and subspecific differences in vocalisations and on the way in which birds hear and produce sounds themselves. The book is liberally illustrated with sound spectrograms and graphs which make an exciting visual complement to the text; it is to be hoped that it will induce more ornithologists to study this somewhat neglected aspect of bird behaviour.

ERIC SIMMS

The Birds of the British Isles. By David A. Bannerman. Illustrated by George E. Lodge. Vols. IX and X. Oliver & Boyd, Edinburgh and London, 1960 and 1961. 410 and 330 pages; 26 and 23 colour plates. 63s. each.

Such is the spaciousness of Dr. Bannerman's plan that in these two volumes he covers only some sixty waders at an average of a dozen pages apiece. This enables him to include many special contributions from other authors, notably in the case of American species. The life histories of a dozen of these have been written by Dr. George Miksch Sutton whose expressed conviction that the Eskimo Curlew is not

extinct has been given welcome support in a recent issue of *The Auk* (78: 259-260). There some apparently reliable sight identifications on spring migration in Texas in both 1959 and 1960 were described in detail. However, it would still be premature to criticise Dr. Sutton's seemingly inconsistent use of the past tense in describing the migration and breeding habits of this species.

In addition to the godwits, curlews and snipe, Volume IX deals with the phalaropes and Turnstone, the genus *Calidris* and the Sanderling, Ruff, Stilt Sandpiper and Buff-breasted Sandpiper. It also includes an index to English names in the first nine volumes; this has been produced by Lord Alanbrooke, but it is to be hoped that he was not held responsible for the proof-reading which has let through such odd entries as "Sparrow, hawk" and "Vireu, red-eyed". Something has also gone wrong in the full and interesting account of the European decline of the Great Snipe on page 114, where a status note presumably meant to refer to Estonia is given under Finland in contradiction to what has just been written regarding that country. We must take issue with the author over his strictures on our predecessor H. F. Witherby's use of the term "southern England" to cover the East Anglian breeding locality of the Black-tailed Godwit in 1937. Under "South Country" the Oxford Dictionary says "of England (south of the Wash)" and it is gratuitous of Dr. Bannerman to suggest that in following this definition Witherby "gratuitously led readers . . . astray".

In his preface to volume IX Dr. Bannerman raises what is perhaps the most difficult and delicate problem to have troubled British ornithologists this century—the right treatment of the "Hastings rarities" recorded in its first two decades. He gives his reasons for concluding that these records should stand, and expresses concern at the prospect of the matter being reopened. However, the editors of *British Birds* decided some time ago that this unwelcome task must be faced, and only the necessity for including fresh evidence has prevented earlier publication of their analysis, which is now being revised for the press. They recognise, and are sorry for, the inconvenience caused to authors such as Dr. Bannerman, but they could not fairly anticipate the comprehensive survey which the subject required. Meanwhile, it is interesting to note that, despite his declared line, Dr. Bannerman himself does not disguise his dissatisfaction with such records as those of the six Slender-billed Curlews recorded near Hastings in 1910 and 1914, of which he writes: "We are not told who actually procured these specimens or in whose possession they were when examined in the flesh by competent naturalists, nor by whom they were mounted!"

Volume X covers the genera *Limicola*, *Actitis*, *Tringa*, *Totanus* and *Heteroscelus*, and the plovers, Black-winged Stilt, Avocet and Oyster-

catcher. Dr. Bannerman follows the A.O.U. Check-List (1957) in retaining the genus *Eupoda* for the Caspian Plover, instead of including it in *Charadrius*, and in maintaining the specific distinctness of the Spotted and Common Sandpipers, for which he still keeps the genus *Actitis*. In a book so informative about habits in African winter-quarters, it is surprising that the fondness of Common Sandpipers for resting on Hippopotamuses should not be mentioned. Another unexpected omission is the recent work of scientists from the Ministry of Agriculture, Fisheries and Food on the feeding habits of the Oystercatcher. While the frequent reliance on other contributors to deal wholly or partly with particular species greatly strengthens the work in the main, it sometimes produces a badly unbalanced account and one such contribution (contrary to Dr. Bannerman's own admirable standards) appears to draw heavily on K. G. Spencer's *The Lapwing in Britain* with scant acknowledgement.

It would not be difficult to add further criticisms, but when all is said, as volume succeeds volume, the scale and, indeed, magnificence of Dr. Bannerman's achievement reduces to relative insignificance the points on which he can justly be faulted, once it is accepted that such a work should be of this particular character. Basically, it may be felt, the conception which Dr. Bannerman has adopted is not contemporary, but, if it lacks certain features which may leave some readers feeling deprived, it offers in rich and generous measure others which modern works are very apt to cut out. George Lodge's plates equally do not exhale the spirit of the 1960's. Yet how gloriously they reflect the peculiar virtues of the great days of British bird portraiture. How much pleasure they will give in evoking so many birds just as bird-watchers hope to see them and, when fortune favours, do indeed see them. Let us, therefore, after fulfilling our critical task, conclude by raising a suitably appreciative cheer as Dr. Bannerman's stately caravan rolls by.

E. M. NICHOLSON

Sea-Birds. By Charles Vaucher. Translated by James Hogarth. (Oliver & Boyd, Edinburgh and London, 1960. 254 pages; 252 photographs, including 15 colour. £5 5s.

Familiarity may sometimes lead us to forget that the birds of our own sea cliffs provide a spectacle as exciting as those of any marsh or delta abroad, and in settings which are scenically far superior. Charles Vaucher, a Swiss ornithologist, has approached the nesting birds of the north European cliffs and dunes with something of the delighted wonder of the British photographer first seeing the Flamingoes of the Camargue, and the result is a rich and attractive pictorial record. His studies cover, very generously in most cases, the Fulmar, Cormorant, Shag, Gannet and Arctic Skua, the gulls, terns and auks, the

Shelduck and Eider, and, briefly, three waders, the Oystercatcher, Ringed Plover and Turnstone. Many of these have often been photographed before, but his individual and romantic approach, with a free use of large close-ups and many superb flight shots, evokes most successfully the thrill of the great sea-bird colonies. Many of his photographs were taken in Britain, on the Farnes and the Bass Rock and at Tentsmuir; others in the Baltic and Brittany. In some ways, it would have been more rewarding to the British reader if he had given us more pictures of the strange, glacier-smoothed islands of the Finnish archipelago, and of such birds as the Caspian Tern and Little Gull, which are less well known to us.

In the accompanying text, he describes the various species in their nesting places, and his experiences in photographing them. His prose is alive and colourful; he brings the scene so vividly before us that it is perhaps ungrateful to complain that he tells us little that is new. There is also an appendix of descriptive summaries, giving the plumage, measurements, breeding data and distribution of each species in a convenient but rather condensed form. In sum, this is a glorious, if expensive, picture book, which will bring back powerfully in the winter evenings, the sights, and almost the sounds, of the teeming sea-bird colonies of the northern oceans.

STANLEY CRAMP

The following publications were received in 1961, in addition to those reviewed:

Birds of Eastern and North Eastern Africa. By C. W. Mackworth-Præd and C. H. B. Grant. Longmans, London, 1960. Second edition. 50s.

Blind Jack. By Stéphanie Roden Ryder. Harrap, London, 1960. 12s. 6d.

Cage Birds. By R. M. Lockley. Pan Books, London, 1961. 2s. 6d.

Iceland Summer. By G. M. Sutton. University of Oklahoma Press, Norman, 1961. 47s. 6d.

Bird Doctor. By Katherine Tottenham. Nelson, London and Edinburgh, 1961. 15s.

The Book of Bird Life. By Arthur A. Allen. Van Nostrand, Princeton, U.S.A., 1961. Second edition. 56s. 6d.

Sex Ratios and Age Ratios in North American Ducks. By Frank C. Bellrose, Thomas G. Scott, Arthur S. Hawkins and Jessop B. Low. Illinois Natural History Survey Bulletin, Volume 27, Article 6, 1961. \$1.00.

Binoculars and Telescopes for Field Work. By J. R. Hebditch. British Trust for Ornithology, Oxford, 1961. Fourth edition, revised with new title. 1s. 6d.

The Birds of the Lonely Lake. By A. Windsor-Richards. Illustrated by D. J. Watkins-Pitchford. Ernest Benn, London, 1961. 11s. 6d.

The Birds of British Somaliland and the Gulf of Aden. By Sir Geoffrey Archer, K.C.M.G., and Eva M. Godman. Volumes 3 and 4. Oliver and Boyd, Edinburgh and London, 1961. £9 9s. the set of two volumes.

Letters

White-throated Sparrows in captivity

Sirs,—I read with interest Mr. J. T. R. Sharrock's account of a White-throated Sparrow (*Zonotrichia albicollis*) at Needs Oar Point, near Beaulieu, Hampshire, in May 1961 (*Brit. Birds*, 54: 366-367). I feel you should know, however, that three of these birds escaped from an aviary in the vicinity of Datchet, Buckinghamshire, in late September 1960. One was in immature plumage; the other two were adults, one of them a known female. All were colour-ringed with plastic rings, in black, green and red respectively. A fourth bird was killed by a cat.

G. T. NELSON

[When Mr. Sharrock's observation was considered by the Rarity Records Committee, enquiries were made about White-throated Sparrows in captivity in Britain and these seemed to show that none had been imported in recent years. The birds mentioned by Mr. Nelson were known, but, owing to a misunderstanding, it was thought that they were the closely related White-crowned Sparrows (*Z. leucophrys*). The Hampshire bird was not ringed, however, and in any case it seems unlikely to have had any connection with the ones from Datchet in view of the letter which follows.—Eds.]

White-throated Sparrow and American Robin crossing Atlantic on board ship

Sirs,—I sailed from New York in R.M.S. *Queen Elizabeth* on 26th April 1961. The following afternoon, when we were about 700 miles out and slightly north of east from New York, I observed a White-throated Sparrow (*Zonotrichia albicollis*) below the bridge. Subsequently I got so close that I was almost able to get it in my hand. It roosted in the garden lounge and was fed by various stewards, staying with us at least until we were off the Isles of Scilly on 30th April. I last saw it about noon that day, when it was with an American Robin (*Turdus migratorius*) which had been on board for about the same period of time. I was very busy towards the end of the voyage, however, and so could easily have overlooked it on 1st May. We were in harbour all that afternoon and one might have expected that it would have gone ashore in France. On the other hand, I believe that it stayed on board until we were in Southampton Water. It seems highly significant to me that we docked in Southampton in the small hours of 2nd May and that it was only three days later that Mr. J. T. R. Sharrock had a brief glimpse of the bird which he subsequently identified as a White-throated Sparrow at Needs Oar Point (*Brit. Birds*, 54:

366-367). This place is on the edge of the Solent and the *Queen Elizabeth* must have passed within six miles of it.

In conclusion, you may be interested to know that I saw a Blue Jay (*Cyanocitta cristata*) fly off north from the crow's-nest (*sic*) about twenty-four hours after we left New York. A. L. DURAND

[Mr. Durand's observations certainly suggest that the Hampshire bird was the one he saw on board the *Queen Elizabeth* though it is impossible to be certain, of course. This does not alter the validity of Mr. Sharrock's record, however, because it is now accepted that the possibility of "assisted passage" should not count against occurrences of American Passerines unless there is direct evidence that the individual concerned did not arrive in a completely free state (*Brit. Birds*, 48: 146-147; 53: 40-41; see also *Ibis*, 98: 156-157). In connection with the American Robin also seen by Mr. Durand, it should perhaps be added that there was a report of this species at large in Britain in the spring of 1961, but that was in Orkney.—Eds.]

"Pale but interesting"

Sirs,—Lest the repeated use of the spelling "Palearctic" in *British Birds* should lead to its general adoption, I should like to point out that it was used in a recent article of mine (54: 320) in defiance of my express objection. I. C. T. NISBET

[Standardised spelling is essential for the uniformity of any journal. Both "Palaeartic" and "Palearctic" are currently in wide use and we prefer the greater simplicity of the latter, even though it involves a further departure from the original Greek. If a close precedent be needed, it should be remembered that the science of animal and plant relationships was formerly "oecology".—Eds.]

Request for information

Breeding distribution and habitats of Pied Flycatcher.—In 1952, on behalf of the British Trust for Ornithology, Dr. Bruce Campbell conducted an enquiry into the breeding distribution and habitats of the Pied Flycatcher (*Muscicapa hypoleuca*) in Britain. The results were later published in *Bird Study* (1: 81-101; 2: 24-32, 179-191), in a paper which traced the history of the species since its first record in 1676 and showed that there had been a phase of increase and spread since 1940. In those twelve years seven countries had recorded breeding for the first time and the species had reappeared in ten others after long intervals. This enquiry is to be repeated in 1962, after a decade in which the spread seems to have slowed down. During this time, in fact, a population breeding in nest-boxes in the Forest of Dean has decreased by about 30%. Anyone who is willing to help is asked to write to Dr. Campbell at Hordley, Woodstock, Oxfordshire. Negative information from suitable habitats between the Humber and Bristol Channel is also needed.

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

[These are largely unchecked reports, not authenticated records]

This summary attempts to review the rarer birds of the autumn against a background of the more striking movements of common species. It covers the three-month period from early August to early November and has had to be divided into two parts. What follows now is largely confined to Passerines and the few additional land birds which one tends to associate with them, except that the American picture is given in full. All other waders, gulls, terns, ducks and so on will be summarised in our next issue.

THE GENERAL PICTURE

The usual autumn pattern includes a steady passage of chats and warblers in August, one or more falls of Scandinavian migrants in September and immigrations of various thrushes in October. In addition, excess populations of species normally regarded as residents lead to random dispersals which sometimes amount to eruptions (or eruptions from the Continent).

This autumn the passage of night migrants in August was generally rather poor and the numbers of **Whitethroats** (*Sylvia communis*) and **Willow Warblers** (*Phylloscopus trochilus*) mostly well below average. At the end of the month, however, and in the first week of September, there was a striking arrival of Scandinavian Passerines, among which **Pied Flycatchers** (*Muscicapa hypoleuca*) were particularly conspicuous. This movement will be properly discussed in *Bird Migration* and it is sufficient to say here that the first Pied Flycatchers arrived on the east coast on 29th August when about 40 were noted at Spurn (Yorkshire). More and more were reported in the next few days until by 2nd and 3rd September these birds were being seen in thirties and forties all down the east coast from Shetland to Kent. From the 29th too, but more particularly from the 31st, there were also a few in the Irish Sea area at such places as Anglesey and Bardsey (Caernarvonshire). Single birds appeared inland in many parts of England at this time, but very few were noted on the south coast until a fortnight later. With the Pied Flycatchers came smaller numbers of **Spotted Flycatchers** (*M. striata*), a lot of **Willow Warblers**, **Wheatears** (*Oenanthe oenanthe*) and **Whinchats** (*Saxicola rubetra*), and the usual patterning of **Redstarts** (*Phoenicurus phoenicurus*), **Blackcaps** (*S. atricapilla*) and **Garden Warblers** (*S. borin*). A few **Wrynecks** (*Jynx torquilla*), **Red-backed Thrushes** (*Lanius cristatus collurio*), **Ortolan Buntings** (*Emberiza hortulana*) and **Bluetits** (*Cyanosylvia svecica*) also accompanied them; the last two species will be dealt with in greater detail below. In the last three weeks of September, too, there were several reports of whitish-looking **Treecreepers** (*Certhia familiaris*) on the east coast from Norfolk to Northumberland and Shetland, as well as one or two on the south and west, and these were probably immigrants.

Redwings (*Turdus muscivorus*) and **Fieldfares** (*T. pilaris*) were both later than usual. Normally the first flocks of Redwings come before the end of September and Fieldfares have usually arrived in bulk by the second week of October. This year there were odd individuals of both species in August, including single Fieldfares at Spurn (Yorkshire) on the 11th and North Coates (Lincolnshire) on the 26th, but there was no real fall of Redwings before 4th October and Fieldfares were little in evidence until three weeks later. Nocturnal movements of Redwings were widely reported on the nights of 12th/13th and 13th/14th October, and there was a big diurnal

passage on the mornings of 18th, 19th and 20th. These were utterly dwarfed, however, by a remarkable influx of both these thrushes, and especially of **Blackbirds** (*T. merula*), on 5th and 6th November. This will also be dealt with more fully in *Bird Migration*, but we cannot refrain from commenting on the thousands (and, in some cases, tens of thousands) of Blackbirds and Fieldfares which appeared at this time in Kent, Essex, Suffolk, Norfolk, Lincolnshire and Yorkshire, with smaller numbers further north at least to Fife. Some slight indication of the size of the Blackbird fall can be got from the fact that on 5th November no less than 647 were trapped and ringed out of an estimated total of at least 8,000 at Spurn (Yorkshire), while 35 miles away at Gibraltar Point (Lincolnshire) 858 were ringed and it was estimated that 100,000 passed over. In Suffolk one farmer described the Blackbirds as being "three to a yard all over the fields". The Fieldfares, however, mostly went on inland: 35,000 arrived at Hunstanton (Norfolk) early on the 5th and similar mass movements were reported on other parts of the coast, but few of these birds came down as the Blackbirds did and there were several observations of flights of a thousand or more in such inland counties as Oxford and even over London. There was also a very big immigration of **Starlings** (*Sturnus vulgaris*) at this time, and quite a large fall of **Woodcock** (*Scolopax rusticola*) from East Anglia to eastern Scotland.

Siskins (*Carduelis spinus*) started to arrive on the east coast in mid-September at the same time as in 1960 when there was a widespread irruption (*Brit. Birds*, 53: 541-542; *Bird Migration*, 2: 13), but the numbers were not large. Many more came in during the first week of October, however, when flocks of up to 200 were seen in Orkney and there were more than anybody living there could remember. Soon afterwards, flocks of 40 or 50 were noted at various places on the east coast and even inland in such counties as Derbyshire. By the third week, they had reached a line from Hertfordshire to Glamorgan. A few **Waxwings** (*Bombycilla garrulus*) also arrived in Orkney and Shetland at the beginning of October and there was evidently quite an influx with the Blackbirds on 5th and 6th November, for we had a sudden spate of reports in east coast counties from Essex to Shetland, including parties of ten to twenty in Essex, Norfolk, Berwick and Roxburgh. In the next fortnight, particularly from the 9th to 19th, there were ones and twos, and odd parties of up to four and six, in such inland counties as Nottingham, Derby, Leicester, Northampton and Cambridge, as well as a few further south in Surrey and Sussex and others to the west in Shropshire, Cheshire, Lancashire and the Isle of Man. It is doubtful, however, if the numbers merit the use of the term "irruption" although it is interesting to note that Waxwings similarly began to arrive in Denmark on the 4th.

From immigrants we turn to eruptions within the British Isles. The unusually high population of **Goldfinches** (*Carduelis carduelis*) was mentioned in our last summary (page 336) and the numbers and sizes of flocks of this species first attracted attention in south-east England and East Anglia in early July. Since August a similar situation has been noted in other southern counties as far west as Cornwall and in several Midland areas as well. **Linnetts** (*C. cannabina*) also seem to have been rather more numerous than usual. There has also been evidence of movements of **Bullfinches** (*Pyrrhula pyrrhula*) in the east and south, but it is not yet certain whether these are immigrants or native stock. In this connection, however, it is interesting to note that Bullfinches are now reported as unusually common in Denmark, and birds of the Northern form (*P. p. pyrrhula*) were recorded on Fair Isle in the last ten days of October and the first week of November. **Snow Buntings** (*Plectrophenax nivalis*) are normally confined mainly to the east coast and it is perhaps significant that there have been a number of unusual reports from Leicestershire to Lancashire and Hertfordshire to Herefordshire.

Great Tits (*Parus major*) and **Blue Tits** (*P. caeruleus*) have again shown a widespread autumn dispersal, just as they did in 1959 and have done to a lesser extent each year since the events of 1957 first drew attention to this phenomenon and

spotlighted the present high populations of tits (*Brit. Birds*, 53: 49-77, 99-171 176-192). There has also been some movement of **Coal Tits** (*P. ater*), particularly in parts of Lancashire and Cheshire, the Midlands, East Anglia and the south coast, and we understand that Coal Tits are considerably more numerous than usual in Denmark where an invasion of Blue Tits is also now taking place.

Long-tailed Tits (*Aegithalos caudatus*), which are very much affected by hard winters and were reduced almost to nothing by the great freeze of 1946/47, are again hardly less common than they were in the autumn of 1960 (*Brit. Birds*, 53: 542) and an eruption of **Bearded Tits** (*Parus biarmicus*) is now taking place for the third year in succession. This is perhaps surprising as reports from East Anglia in August and September suggested that the population was not at as high a level as in 1959 and 1960. Nevertheless, seventeen appeared at Rye Meads (Hertfordshire) on 12th October and there were four others there on the 21st; two were seen at Tring (Hertfordshire) on 1st November and what were presumably the same birds were then variously reported at Wilstone and Marsworth Reservoirs until at least 5th November, when between three and six were located near Oxford and two appeared at Bradwell (Essex). There was also one by Pagham Harbour (Sussex) on 29th October. Autumn departures were again noted at Minsmere (Suffolk) and Swanderers were seen at Holme (Norfolk) and Wicken (Cambridgeshire) in October.

Another species which has a comparably local breeding distribution, and which has also been building up steadily since 1947, is the **Dartford Warbler** (*Sylvia undata*). Its numbers are at a similarly high level in some areas and so it is interesting to find that it is also showing signs of a dispersal after the breeding season. Since the second week of October some eight or nine have been recorded at the three most regularly watched points on the south coast. The first was at Selsey Bill (Sussex) on 8th and 9th October, the second and third were a female and a male at Portland (Dorset) on 13th and 14th October respectively, the fourth was also at Portland on 19th and 30th October, and Dungeness (Kent) then had a total of four or five on six dates during 5th-26th November, including three on the 19th.

Perhaps the most unexpected eruptive species this autumn has been the **Dunnock** (*Prunella modularis*), however. Unprecedented numbers appeared at Gibraltar Point (Lincolnshire) in the first three days of September. Soon afterwards, these birds began to be noted in tens and fifties, in places where ones and fives are more usual, on the coasts of Yorkshire, Lincolnshire, Norfolk, Suffolk and Essex. In these areas the numbers were first commented on in mid-September, but it was not until nearly a month later that a similar dispersal of Dunnocks on the coasts of Sussex, Hampshire and Dorset was reported. Since then these rather unobtrusive birds have been sufficiently numerous to attract attention in a few inland counties as well and we await developments with interest. **Jays** (*Garrulus glandarius*) have been reported on the move in the west and south from Pembrokeshire round to Dorset and Sussex, and a marked increase was noted in Herefordshire in October, but the observations are too scattered for one to be able to draw any general picture.

WARBLERS

Warblers have been well represented among the scattering of vagrants. They have included a species new to Britain and Ireland, two others which have been recorded only once, and four more which have been known to occur on less than a dozen previous occasions. Taking the regular species into account, there have been no less than nine *Phylloscopus* and five *Locustella*.

As mentioned last month (page 396), single **Bonelli's Warblers** (*Phylloscopus bonelli*) appeared at Cape Clear (Co. Cork) on 2nd and 3rd September and at Fair Isle (Shetland) on the 22nd; in connection with the former it is interesting to note there was also one on Ushant, France, on 1st September. The only **Arctic Warblers** (*A. borealis*) were on the Isle of May (Fife) on 5th and 6th September and on Fair

Isle on the 26th. Fair Isle added another member of the primarily Asiatic genus to its list when the second British **Dusky Warbler** (*Ph. fuscatus*) was trapped there on 14th October. Equally rare and from a similarly distant part of Asia was a **Radde's Bush Warbler** (*Ph. schwarzi*) caught near Blakeney Point (Norfolk) on 3rd October, ringed and released on the 4th and last seen on the 5th. There were six records of **Greenish Warbler** (*Ph. trochiloides*)—on Skokholm (Pembrokeshire) on 30th and 31st August, at Fair Isle on 1st September, at Whitley Bay (Northumberland) on 17th September, at Dungeness (Kent) on 24th September, at Cape Clear on 14th October and at Redcar (Yorkshire) on 20th October. **Yellow-browed Warblers** (*Ph. inornatus*) were less numerous than in the last two autumns and there was no striking peak as in 1960 (*Brit. Birds*, 53: 538). Fourteen records of this species were scattered between 17th September and 14th October. The first, curiously, was on the south coast at Selsey Bill (Sussex) and the second was on the Isle of May eight days later, on the 25th and 26th. There was then one at Dungeness on the 30th, and one at Minsmere (Suffolk) and two at Fair Isle on 2nd October, followed by single birds at Fair Isle on 3rd and 9th-10th October, at Riding Mill (Northumberland) on the 4th and 14th, and at Spurn (Yorkshire) and Cape Clear on the 5th. Finally, there was a little group of records in the west in mid-October, at Malin Head (Co. Donegal) on the 13th, and at Cape Clear again and Skokholm on the 14th. Thus the only *Phylloscopus* on the British list not recorded here this autumn was Pallas's Warbler (*Ph. proregulus*).

On the other hand, the rather confusingly named **Pallas's Grasshopper Warbler** (*Locustella certhiola*) was discovered over here for only the fourth time when one was identified on St. Agnes (Isles of Scilly) on 7th October, at the height of the peak period for eastern species. Two other rare *Locustella* reached Fair Isle—a **River Warbler** (*L. fluviatilis*) on 24th September and a **Lanceolated Warbler** (*L. lanceolata*) from 2nd to 14th October. The River Warbler has not previously been recorded in Britain or Ireland, but the Lanceolated Warbler has now reached Fair Isle on ten occasions and there were two observations there in 1960 (*Brit. Birds*, 54: 142-145).

The **Aquatic Warbler** (*Acrocephalus paludicola*), once regarded as a rare vagrant, kept up its now regular autumn appearance in small numbers. A total of thirteen records, involving fifteen birds, in Norfolk, Kent, Sussex, Berkshire, Hampshire, Dorset, Somerset, Pembrokeshire and Cos. Wexford and Cork between 2nd August and 30th September confirms the essentially south coast picture that we have now come to expect. Two other species whose occurrences are best looked at in summarised form are the **Melodious** and **Icterine Warblers** (*Hippolais polyglotta* and *icterina*). There were 17 reports of Melodious Warblers, involving at least 21 individuals. These followed the usual pattern, rather different from that of the Aquatic Warbler, in that the centre lies in the area between south-west Ireland, the northern part of the Irish Sea and Dorset. Only four of the observations were outside this area and three of those were just further along the south coast, in Sussex (two) and Kent. The remaining record was an unusual inland one, at Rye Meads (Hertfordshire) on 12th and 13th August. The main group of Melodious Warblers this year were in Cos. Cork, Mayo and Wexford, Scilly, Dorset, Somerset, Pembroke and Caernarvon and on a ship between Lancashire and the Isle of Man. All but one were between 12th August and 17th September. Most of the Icterine Warblers were in a similar period from 10th August, but with one or two stragglers as late as 6th October. The distribution of Icterine records was rather puzzling in that there were very few on the east coast where this species is usually most commonly found—only, in fact, a single one in Suffolk, two in Norfolk, one or two in Yorkshire and one in Kent. Indeed, there were more on the south coast, with two in Dorset, one in Sussex, three at Great Saltee (Co. Wexford) and at least three different birds at Cape Clear. One at Great Saltee stayed there off passage from 20th September.

ber to 6th October. In all, there were twelve records, involving at least fourteen individuals. For the first time, therefore, Icterines were outnumbered by Melodious Warblers. As usual, however, we also received a number of indeterminate records referring to one or other of these two very similar species. There were at least seven in this category, all in the south—from Sussex and Dorset to Devon, Somerset, the Isles of Scilly and Co. Cork. Another *Hippolais* was an **Olivaceous Warbler** (*H. pallida*) on St. Agnes (Isles of Scilly) on 3rd and 4th October.

One last species which we should mention in this section is the **Barred Warbler** (*Sylvia nisoria*). Many fewer reports reached us than in either of the last two years. In fact, apart from several at Fair Isle there were only a dozen records. These were mostly scattered down the east coast from Shetland to Essex between 31st August and 29th October, but there were three more unusual occurrences in the south-west—on Great Saltee on 31st August, at Cape Clear on 6th and 7th October and on St. Agnes on 8th and 9th October (two birds on the latter day). At Fair Isle, after one from 20th to 27th August, Barred Warblers were seen every day from 4th to 9th September (maximum four on the 4th) and on the 20th and 22nd. There was also one on Ushant, France, on 2nd September.

THRUSHES AND CHATS

Among the Asian vagrants recorded on Fair Isle this autumn was a first-winter female **Dusky Thrush** (*Turdus eunomus*), which stayed from 18th to 21st October and which was caught and ringed on the 19th; there are now only two previous accepted records of this species in Britain. Another great rarity which recently seems to have been turning up every couple of years or so, usually in the winter months, is the **Desert Wheatear** (*Oenanthe deserti*) and one was seen on Farlington Marshes (Hampshire) on 4th and 5th November. Of rather less frequent occurrence in the last decade or two, however, has been the **Alpine Accentor** (*Prunella collaris*) and so it is pleasant to note that one was identified at Pett Level (Sussex) on 12th October.

In 1960 **Bluethroats** (*Cyanosylvia svecica*) were mainly in north-east England and east Scotland, and chiefly in the second half of September (*Brit. Birds*, 53: 539-540). In 1961 there were rather fewer—only about nineteen altogether—and the majority of these coincided with the fall of Scandinavian migrants in late August and early September; the rest were in the first half of October. The first was at Steart (Somerset) on 27th August, followed by one on Great Saltee (Co. Wexford) three days later. One at Foulness (Essex) on 2nd September was a male of the Red-spotted form. There was then a spate of records, with one at Bradwell (Essex) on the 2nd and another there on the 4th, one on the Isle of Sheppey (Kent) on the 3rd, single birds on Fair Isle and St. Mary's Island (Northumberland) on the 4th, and two or three at Blakeney Point (Norfolk) on the 4th and 5th. There was then one on The Skerries (Anglesey) on the 10th, one at Dungeness (Kent) and one at Ditchling Beacon (Sussex) on the 13th, and one at Slapton Ley (Devon)—the first record for the mainland of that county—on the 17th. After a gap, Fair Isle had two or three daily from 4th to 10th October, and there were other late ones at Portland (Dorset) on the 9th and 10th, and on St. Kilda (Outer Hebrides) from the 13th to the 17th.

FLYCATCHERS AND SHRIKES

In 1959, and to a lesser extent in 1960, one of the most surprising features of the autumn was provided by the numbers of **Red-breasted Flycatchers** (*Muscicapa parva*). Twenty years ago there were under a hundred records of this species in Britain and Ireland, but that figure was approached in 1959 alone (*Brit. Birds*, 53: 46-47) and over thirty-five were reported in 1960 (53: 540). We have probably not yet received all the 1961 observations, but already the total stands at about forty individuals. The earliest of these extend as far back as August when there were

single ones at Craster (Northumberland) on the 15th, Baltimore (Co. Cork) on the 27th and Skokholm (Pembrokeshire) on the 28th. Apart from three records in the first ten days of September, there were then no others until a small influx during 18th-25th September, which was followed by a larger fall in the first fortnight of October. Two of the three early September records were from the south coast—two at Portland (Dorset) on the 8th and one at Gilkicker (Hampshire) on the 9th—and the third was at Spurn (Yorkshire) on the 4th. During 18th-25th September Red-breasted Flycatchers were noted in Shetland, Aberdeenshire, Northumberland, Co. Durham, Yorkshire, Norfolk and Co. Cork, and there was a similar distribution during the later influx in the first half of October when these birds appeared in Shetland, Orkney, Northumberland, Co. Durham, Yorkshire, Lincolnshire, Essex, Dorset, Pembrokeshire, Scilly and Cos. Wexford, Cork and Donegal. The biggest numbers at this time were at Spurn where there were four on 7th October, and on St. Agnes where there were five on the 5th. A good many of them were identified as immatures. It is also interesting to note that one flew aboard a trawler off north-east Iceland on 3rd October.

An interesting shrike record involved a first-winter bird of the *isabellinus* group of **Red-tailed Shrikes** (*Lanius cristatus*) which stayed at Walcott (Norfolk) from 10th to 14th September and was trapped and ringed (discussions of this group were made in *Brit. Birds*, 53: 427; and 54: 209-210). A number of **Red-backed Shrikes** (*L. cristatus collurio*) occurred at this time on the east and south coasts from Shetland round to Cornwall and Scilly, and were probably part of the September influx rather than British breeding stock; a late male was seen at Whitley (Northumberland) on 10th October. At Bamburgh (Northumberland) several observers identified a **Masked Shrike** (*L. nubicus*) on 22nd October. Most surprising was the lack of **Woodchats** (*L. senator*) which in recent years we have come to expect in small numbers every autumn. Indeed, only one has been reported so far—a first-winter bird on Great Saltee (Co. Wexford) on 28th August. **Lesser Grey Shrikes** (*L. minor*), on the other hand, which have been well represented this year, continued to show up in September: there was one at Shotton Pools (Flintshire) on 21st and 22nd September and another on Lundy (Devon) on the 24th, as well as one on Ushant, France, on the 25th. To the earlier observations already given in previous summaries (*Brit. Birds*, 54: 295-296 and 335) we might add an adult which was seen at Barr (Ayrshire) from 15th to 24th June.

FINCHES AND BUNTINGS

Crossbills (*Loxia curvirostra*) have shown no signs of irruption this year, but one or two parties seen on the east coast in August may have come across from Scandinavia and the suggestion of immigration is perhaps supported by the identification of a **Two-barred Crossbill** (*L. leucoptera*) at Bucklebury (Berkshire) on 25th August. Four **Arctic Redpolls** (*Carduelis hornemanni*) arrived on Fair Isle on 19th October and two were ringed. **Serins** (*Serinus canarius*) continue to be reported: there was a male at Farlington Marshes (Hampshire) on 4th November, and two at Dungeness (Kent) a week later. In Britain, **Scarlet Grosbeaks** (*Carpodacus erythrinus*) appeared only in Shetland where there were three at Fair Isle on 4th September and singles from then until the 11th, when one appeared for two days on Foula; Fair Isle also had a late bird from 6th to 8th October. It is interesting to note, however, that one occurred on Ushant on 29th September.

The last three days of August and the first twenty of September—the time of drift from Scandinavia—saw a number of records of **Ortolans** (*Emberiza hortulana*). These were mainly in east coast counties from Shetland to Northumberland, Yorkshire, Norfolk, Suffolk and Kent, but others were seen in Sussex, Dorset, Somerset, Devon, Cornwall, Anglesey and Cos. Wexford, Cork and Mayo; in fact, there were as many as five on Lundy during 9th-12th September. Outside this three-week

period there were only a few reports from Fair Isle, Portland and Great Saltee in the first week of October and two rather later observations at Needs Oar Point (Hampshire) on 15th October and Sandwich Bay (Kent) on 5th November.

Of the rarer buntings, **Little Buntings** (*E. pusilla*) are almost regular on Fair Isle in autumn and the species was recorded there this year on eight days in September and ten in October; there were two birds on 1st October. Otherwise the only Little Buntings identified were on The Skerries (Anglesey) on 25th September, at Spalding (Lincolnshire) on 1st October and on Tory Island (Co. Donegal) on 7th October. There were a surprising number of **Yellow-breasted Buntings** (*E. aureola*), considering that there are only a dozen previous records of this species in Britain and Ireland. One was seen between Zennor and St. Ives (Cornwall) on 17th September, there was a second on the Isle of May (Fife) on 7th October and then a third and fourth on Cape Clear (Co. Cork) on 11th October. There was also the usual scattering of **Red-headed Buntings** (*E. bruniceps*) of dubious origin. These included one on Foula (Shetland) from 6th to 22nd August, one on Lundy (Devon) during August, one at Beachy Head (Sussex) from 11th to 16th September, one on Skokholm (Pembrokeshire) from 19th to 25th September, and one at Knaresborough (Yorkshire) on 20th September and again a month later.

PIPITS AND WAGTAILS

At least seven **Richard's Pipits** (*Anthus novaeseelandiae*) were reported between early September and mid-November, five of them on the east coast and two in the south-west. The first was at Blakeney Point (Norfolk) on 5th September and Spurn (Yorkshire) had two of the others, one passing south on 11th September and one which stayed from 21st October to 4th November. The others were at Fair Isle on 8th and 18th October, at Cape Clear (Co. Cork) on 13th October and on Braunton Marshes (Devon) on 12th November. **Red-throated Pipits** (*A. cervinus*) were seen on Great Saltee (Co. Wexford) on 28th August and St. Kilda (Outer Hebrides) from 7th to 10th October, the former being trapped and ringed. There were also eight or more records of **Tawny Pipits** (*A. campestris*) in September and the first half of October. The first was at Dungeness (Kent) on 1st and 2nd September, followed by another on the 16th; two appeared at Gilkicker Point (Hampshire) on 5th September; there was one at Portland (Dorset) on 17th September and then simultaneous appearances at Langney Point (Sussex) and Skokholm (Pembrokeshire) on the 19th, followed by one by the Hayle Estuary (Cornwall) four days later; finally, St. Agnes (Isles of Scilly) and Cape Clear (Co. Cork) produced single birds on 10th and 12th October respectively.

A first-winter **Yellow-headed Wagtail** (*Motacilla citreola*) stayed on Fair Isle from 4th to 13th September, the fourth to be recorded there since 1954. There are no other British records of this species (*Brit. Birds*, 48: 26-29).

OTHER SPECIES

A juvenile **Rose-coloured Starling** (*Sturnus roseus*) was seen on Cape Clear (Co. Cork) on 31st August and 2nd to 8th September, and another stayed on Fair Isle from 1st to 14th September. The latter was trapped and ringed. Two adult Rose-coloured Starlings were also reported during the autumn, at Tewkesbury (Gloucestershire) on 17th July and Southminster (Essex) from at least 8th to 18th October but these are both thought likely to have been escapes from captivity.

Alpine Swifts (*Apus melba*) appeared at Llanrhian (Pembrokeshire) on 29th August and at Cliffe (Kent) on 7th October. A **Red-rumped Swallow** (*Hirundo daurica*) was identified at Bucklebury (Berkshire) on 31st August. Among records of **Golden Orioles** (*Oriolus oriolus*) was a first-winter female ringed on Bardsey (Caernarvonshire) on 19th September.

It was generally rather a poor autumn for **Hoopoes** (*Upupa epops*) with only odd ones on the south coast from August to October, but also one at Spurn (Yorkshire)

from 9th to 15th August, one at Skokholm on 18th September and one near Holyhead (Anglesey) on 21st October.

AMERICAN VAGRANTS

Two American Passerines of no little interest occurred in Europe in the second week of October and, as it would be illogical to separate these from the other New World vagrants, this section is not confined solely to small land birds. The most commonly recorded American species was, as usual, the **Pectoral Sandpiper** (*Calidris melanotos*). In fact there were at least 21 records of Pectoral Sandpipers, involving some 26 or 27 individuals. Five of these birds were in August, seventeen or eighteen in September and four in October. After one at Stoke (Kent) on 12th August, no more were reported until the very end of the month, but there were then simultaneous appearances on the 31st of single ones on Tresco (Isles of Scilly) and Lundy (Devon) and of two on Foula (Shetland). The bulk of the records came in the fortnight from 3rd to 17th September. During this time the species was reported in Cos. Down, Belfast and Antrim, Anglesey, Flint, Scilly, Cornwall, Hampshire, Kent, Norfolk, Co. Durham and Shetland. No less than three of the records, involved two birds and one three. Several stayed for varying periods up to thirteen days and one remained in the same place for over three weeks; two or three were trapped and ringed. No new arrivals were reported between 17th September and 5th October, except one at Lincoln from 30th September onwards, but there were then three or four which formed an interesting background to other American species (see below). One was seen on St. Agnes (Isles of Scilly) on 5th October, and probably another on the 9th; meanwhile there was one near Southampton (Hampshire) on the 6th and 7th and one at Langtoft (Northamptonshire) on the 8th.

Other American waders were rather poorly represented. A **Lesser Yellowlegs** (*Tringa flavipes*) was identified on the River Amble (Cornwall) on 18th September and the only other was on Skokholm (Pembrokeshire) on 9th and 10th October. Single **Buff-breasted Sandpipers** (*Tryngites subruficollis*) were at Lough Beg (Co. Antrim) in mid-August (this one stayed for ten days), at Minsmere (Suffolk) on 1st September and near Slimbridge (Gloucestershire) on 17th September; and **Baird's Sandpipers** (*Calidris bairdii*) at Wyboston (Bedfordshire) from 13th to 24th September and at Tynningham (East Lothian) on 1st October. A **Wilson's Phalarope** (*Phalaropus tricolor*) at Lady's Island Lake (Co. Wexford) on 12th and 13th August was the third of this species in Britain and Ireland this year (*Brit. Birds*, 54: 295, 333), and the wader list was completed by a **dowitcher** (*Limnodromus* sp.) at Grove Ferry (Kent) from 29th October until at least late November.

Of American ducks and gulls there were only six records. These included male **Surf Scoters** (*Melanitta perspicillata*) at Spurn (Yorkshire) on 30th August and at Portland (Dorset) a month later, and drake **Green-winged Teal** (*Anas crecca carolinensis*) at Gladhouse Reservoir (Midlothian) at the end of October and at Hilfield Park Reservoir (Hertfordshire) on 11th November. An immature male **American Wigeon** (*Anas americana*) was seen on the Isle of Sheppey (Kent) on 28th October and there was a first-winter **Bonaparte's Gull** (*Larus philadelphia*) at Sidmouth (Devon) on the 30th.

We have left until last the two Passerines which prompted this section. A **Gray-checked Thrush** (*Ilyocichla minima*), of which there are only two previous British records, was trapped on Bardsey (Caernarvonshire) on 10th October, and the same day an **American Redstart** (*Setophaga ruticilla*) died on Ushant, France. The latter was the first record for Europe and brought to seven the total of species of American wood warblers known to have occurred this side of the Atlantic (*Brit. Birds*, 53: 575). The fact that these two birds appeared simultaneously nearly three hundred miles apart, at a period when there was a little spate of Pectoral Sandpipers and a Lesser Yellowlegs, suggests a common weather factor.

Notice to Contributors

British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. After publication 20 separates of papers are sent free to authors; additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

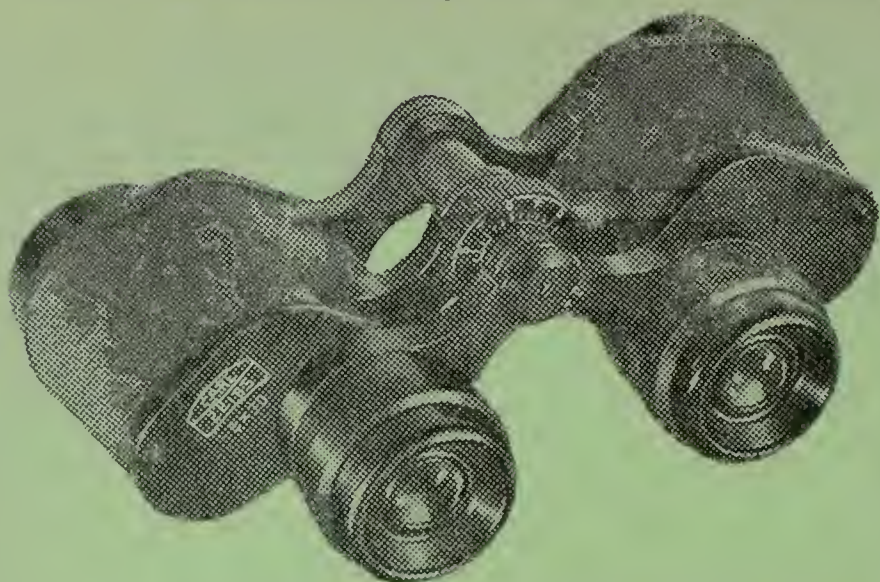
3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1961" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form: TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34. Various other conventions concerning references, including their use in the text, should be noted by consulting examples in this issue.

4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

5. Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.


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British Birds

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of birds ringed abroad

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PURCHASED



British Birds

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British Birds

VOL. 54 1961

RINGING SUPPLEMENT



Report on bird-ringing for 1960*

By Robert Spencer

Ringling Officer, B.T.O.

EACH ANNUAL REPORT on bird-ringing is necessarily a compromise. It must attempt to provide a reasonably comprehensive review of the year's work for the ringers whose work it records; it must pick out for the general reader the highlights and broad trends; and, last but not least, it must be an accurate, usable source of reference for students at home and abroad who cannot consult the original data. With these objects in mind, we have retained the use of illustrative maps, these having been welcomed by readers of the previous report, and have introduced an additional item dealing with longevity. At the head of each species in the recovery section the "age" of the oldest bird recovered during the year has been given in years and twelfths of a year. It must be emphasised that the age indicated is strictly the time lapsed between ringing and recovery and is thus minimal. It is hoped to make this a regular feature of future reports and thus, over the years, to give some guide to longevity.

Since the last report was issued the cumulative ringing totals for each species have been recalculated from the annual records and, in the process, birds ringed overseas (chiefly during the early years of the scheme) have been omitted. This work has necessitated numerous small adjustments, both up and down, to the figures in Table 2 and has brought to light hitherto overlooked records of the ringing of Sardinian Warbler (*Brit. Birds*, 48: 515) and Ptarmigan. The total number of species ringed in Britain and Ireland in the first fifty years of ringing, 1909-1959, was thus 288. To these can be added a further six species ringed for the first time in 1960: Cory's Shearwater (*Procellaria diomedea*) by Spurn Bird Observatory, Kite (*Milvus milvus*) by A. E. Billett, Rough-legged Buzzard (*Buteo lagopus*) by R. P. Cockbain,

*This is the twenty-fourth report issued on behalf of the Bird-Ringing Committee, and is a publication of the British Trust for Ornithology. For the twenty-third report see *Brit. Birds*, 53: 457-512.

Dusky Thrush (*Turdus eunomus*) by F. Wrigglesworth, Myrtle Warbler (*Dendroica coronata*) by Lundy Bird Observatory and Slate-coloured Junco (*Junco hyemalis*) by Dungeness Bird Observatory. The British status of the last-named bird, a North American species, is still under consideration by the B.O.U. Records Committee. The Cory's Shearwater has been included here because it was ringed and released at Spurn, but it cannot be regarded as a British record because the bird had come on board a ship at an unknown point and been brought in captivity to Hull some days later (*Yorkshire Naturalists' Union Ornithological Report for 1960*: 82).

For the first time in many years the Starling lost its position as the most frequently ringed bird. Table 2 shows that 22,216 Blackbirds were ringed in 1960, the other species reaching five figures being Starling (21,225), Blue Tit (17,209), House Sparrow (16,737), Swallow (13,374) and Sand Martin (13,192). There were impressive increases for various species more humbly placed in the table. For example, the 178 Little Stints marked in 1960 may be contrasted with the seven which called for special mention in the introduction to the 1956 report. Knot leapt by the startling figure of 568 to a total of 726 and over 4,500 Dunlin were ringed. The 1960 total for Greenfinches—a species which was unusually abundant in the early part of the year—was almost double the previous highest annual total. The Mute Swan began to achieve a position in the list more commensurate with its status in the country. On the other hand, for the first time in ten years the Wildfowl Trust undertook no rocket-netting of Pink-footed Geese and only one was ringed. From the several waves of Grey Phalaropes which gathered off our south-western coasts in the autumn only eighteen were ringed, but these more than doubled the previous grand total.

Of the special ringing enquiries for which free rings were offered, there were few claimants for auks and shearwaters in Scotland, the remoteness of many of the colonies and the steepness of the cliffs defeating all save the most mobile and the most intrepid. On the other hand, the Sand Martin study attracted considerable support and swiftly established itself as a most valuable project.

As will be seen from Table 1, almost a thousand more birds were recovered in 1960 than in 1959 and for a number of species there are now sufficient data to permit analysis in considerable detail. Such analyses, however, form papers in themselves and here we are concerned to spotlight a few of the more notable records appearing in this report. Taking them in Wetmore order, there are a Garganey in Bulgaria, a White-fronted Goose in Jugoslavia, and several fine wader recoveries including a Bar-tailed Godwit in Siberia, three Little Stints in France and Spain, and three Ruffs in U.S.S.R., Italy and France. Among the list of Swift recoveries will be found the first from Africa,

REPORT ON BIRD-RINGING FOR 1960

while no fewer than nine British-ringed Swallows were reported from that continent during the year. The Wren continues to surprise and there is an intriguing recovery from the Camargue. Then follow a second instalment of southerly Song Thrush and Redwing recoveries for the winter 1959-60, the first British-ringed Blackbird in Iceland and our first Stonechat from Africa. Recoveries of Blackcaps have hitherto indicated a south-westerly migration in the autumn and the spring recovery of a bird of this species in Lebanon was most unexpected. The Red-backed Shrike, on the other hand, has produced several recoveries in a south-easterly direction and the special interest of the recovery near the Austrian border of Germany lies in the fact that it was at 3,000 feet on a route which would take it across the Alps. Among the seed-eaters, Greenfinches, Linnets and Goldfinches all produced unusual numbers of foreign recoveries, the first British-ringed Reed Bunting was recovered abroad, and there were even two foreign recoveries of House Sparrows.

FINANCE

The work of the Bird-Ringing Committee is done under contract to the Nature Conservancy, an annual grant being received to cover the salaries of headquarters staff. A grant of £30 from the main funds of the Trust was received to meet expenses of the special ringing enquiries, and the publishers of *British Birds* made their annual grant of £25. All other expenses were met from the sale of rings.

Full accounts for 1960 have been published in the Annual Report of the British Trust for Ornithology.

COMMITTEE

The members of the Bird-Ringing Committee on 31st December 1960 were Sir Landsborough Thomson (Chairman), Miss E. P. Leach, J. S. Ash, E. J. M. Buxton, J. C. Coulson, C. D. T. Minton, J. D. Macdonald (representing the Trustees of the British Museum), G. R. Mountfort, C. A. Norris, C. M. Perrins, R. G. Pettitt and Major-General C. B. Wainwright; R. K. Cornwallis, R. A. O. Hickling, R. C. Homes, E. R. Parrinder, G. Waterston and D. R. Wilson (*ex officio*); and Robert Spencer (Secretary).

STAFF

Robert Spencer, R. W. Hudson, Miss Anne Schramm and Mrs. E. I. Barham. Miss E. P. Leach, in an honorary capacity, had charge of all reports of rings from foreign schemes.

ACKNOWLEDGEMENTS

Grateful acknowledgement is made to the Trustees for accommodation at the British Museum (Natural History) and for permission to use

the address of the museum on rings; to the Nature Conservancy for the financial support which alone enables the scheme to operate at its present level; and to H. F. and G. Witherby Ltd. for their annual grant. J. D. Macdonald and the staff of the Bird Room helped us readily with all our queries. Miss E. P. Leach, in addition to her work with foreign rings, spent many hours tracing obscure recovery localities and assisted us in various other ways. Derek Goodwin, A. G. Hurrell and Mrs. G. Trust kindly helped us with translations.

PUBLICATIONS IN 1960

The following analyses have been published:

- J. C. Coulson (1960): "A study of the mortality of the Starling based on ringing recoveries". *J. Anim. Ecol.*, 29: 251-271.
 M. J. Goodacre (1960): "The origin of winter visitors to the British Isles. 5. Redwing (*Turdus musicus*)". *Bird Study*, 7: 102-107.
 M. J. Goodacre (1960): "The origin of winter visitors to the British Isles. 6. Song Thrush (*Turdus philomelos*)". *Bird Study*, 7: 108-110.
 M. J. Goodacre (1960): "The origin of winter visitors to the British Isles. 7. Fieldfare (*Turdus pilaris*)". *Bird Study*, 7: 111-113.
 M. C. Radford (1960): "Common Gull movements shown by ringing returns". *Bird Study*, 7: 81-93.

The following papers make use of recoveries of the scheme:

- S. Cramp, A. Pettet and J. T. R. Sharrock (1960): "The irruption of tits in autumn 1957". *Brit. Birds*, 53: 49-77, 99-117, 176-192.
 Barbara Snow (1960): "The breeding biology of the Shag (*Phalacrocorax aris-totelis*) on the island of Lundy, Bristol Channel". *Ibis*, 102: 554-575.
 K. Williamson (1960): "The development of young Snipe studied by mist-netting". *Bird Study*, 7: 63-76.

Table 1

NUMBERS OF BIRDS RINGED AND RECOVERED

				Ringed		Recovered
				<i>Juv./Adult</i>	<i>Pullus*</i>	<i>Total</i>
1960 .. ..	..	..	219,104	60,085	279,189	7,911
1959 .. ..	..	..	184,837	57,488	242,325	6,949
1958 .. ..	..	..	155,414	45,421	200,835	6,374
1957 .. ..	..	..	137,060	49,286	186,346	5,497
1956 .. ..	..	..	104,665	40,069	144,734	4,808
1955 .. ..	..	..	90,585	35,718	126,303	4,063
<hr/>						
Grand total ringed						
1909-1960 .. ..	..	..	..	..	..	2,531,257
<hr/>						
Grand total recovered						
1909-1960 .. ..	..	..	..	..	..	68,699

*An explanation of the term *pullus* or *pull*. appears on page 458.

REPORT ON BIRD-RINGING FOR 1960

Table 2

RINGING AND RECOVERY TOTALS TO 31.12.60

(Compiled by R. W. Hudson)

	Ringed				Recovered	
	Juv./Adult	Pullus	1960 total	Grand total	1960	Grand total
Little Grebe	17	—	17	177	—	9
Leach's Petrel	13	10	23	868	—	5
Storm Petrel	1,435	2	1,437	7,016	2	16
Manx Shearwater	6,702	2,454	9,156	95,650	87	1,032
Boat-tail	113	430	543	5,362	9	76
Jaeger	11	342	353	20,887	42	905
Booby	11	472	483	5,184	107	1,237
Booby	141	1,490	1,631	10,079	166	981
Booby	11	98	109	4,383	46	690
Booby	2,371	117	2,488	30,928	740	4,486
Booby	1,610	18	1,628	30,330	586	5,179
Booby	28	14	42	175	7	24
Booby	28	—	28	163	10	37
Booby	64	2	66	2,125	30	406
Booby	9	—	9	522	9	110
Booby	55	—	55	515	11	111
Booby	42	4	46	922	22	201
Booby	8	3	11	209	4	41
Booby	107	207	314	1,714	10	82
Booby	30	46	76	934	11	54
Booby	6	—	6	574	19	148
Booby	—	—	—	505	12	114
Booby	1	—	1	11,821	286	2,243
Booby	58	—	58	1,202	20	120
Booby	1,323	99	1,422	2,359	166	279
Booby	—	35	35	987	5	54
Booby	19	6	25	1,346	4	204
Booby	—	3	3	121	1	14
Booby	—	52	52	455	3	54
Booby	—	16	16	238	2	35
Booby	—	3	3	170	1	24
Booby	4	26	30	634	2	90
Booby	31	142	173	2,572	24	318
Booby	—	—	—	1,538	—	176
Booby	17	—	17	122	1	4
Booby	62	—	62	466	3	16
Booby	10	1	11	722	—	12
Booby	459	17	476	5,476	12	171
Booby	107	5	112	1,712	15	185
Booby	151	266	417	6,391	15	312
Booby	72	2,482	2,554	72,482	49	1,468
Booby	179	245	424	4,590	8	73
Booby	4	27	31	288	1	9
Booby	27	26	53	574	2	19
Booby	211	—	211	674	1	8
Booby	390	32	422	4,783	21	206
Booby	65	—	65	292	1	9
Booby	20	3	23	5,693	3	438
Booby	51	173	224	6,766	14	277
Booby	33	—	33	139	—	4
Booby	231	66	297	3,994	3	31
Booby	474	204	678	6,088	13	160

BRITISH BIRDS

	Ringed				Recovered	
	Juv./Adult	Pullus	1960 total	Grand total	1960	Grand total
Knot	568	—	568	726	1	
Little Stint	178	—	178	274	3	
Dunlin	4,542	13	4,555	8,267	21	
Curlew Sandpiper	43	—	43	143	—	
Sanderling	22	—	22	150	—	
Ruff	70	—	70	205	4	
Stone Curlew	—	7	7	363	1	
Arctic Skua	10	133	143	1,045	4	
Great Skua	—	428	428	2,495	5	
Great Black-backed Gull	33	370	403	3,083	32	18
Lesser Black-backed Gull	82	1,699	1,781	25,052	75	1,07
Herring Gull	159	3,401	3,560	31,213	179	1,21
Common Gull	22	87	109	4,560	12	10
Black-headed Gull	321	3,088	3,409	51,188	218	2,55
Kittiwake	279	1,716	1,995	15,532	46	30
Common Tern	83	1,229	1,312	31,261	36	60
Arctic Tern	250	2,394	2,644	18,801	37	24
Roseate Tern	5	1,159	1,164	5,194	4	3
Little Tern	8	105	113	2,049	3	2
Sandwich Tern	4	2,402	2,406	36,901	58	63
Razorbill	264	516	780	11,204	21	31
Guillemot	242	327	569	7,769	15	26
Black Guillemot	32	17	49	537	—	
Puffin	416	430	846	14,074	16	8
Stock Dove	30	45	75	2,069	4	14
Rock Dove	—	5	5	121	—	
Woodpigeon	271	317	588	7,656	47	53
Turtle Dove	47	19	66	1,583	5	6
Cuckoo	46	28	74	1,932	8	5
Barn Owl	13	36	49	1,282	5	17
Little Owl	32	37	69	1,607	8	13
Tawny Owl	12	109	121	2,687	10	18
Long-eared Owl	9	6	15	520	2	2
Short-eared Owl	5	23	28	406	2	3
Nightjar	10	22	32	460	1	10
Swift	2,280	236	2,516	11,309	78	269
Kingfisher	163	18	181	1,228	4	45
Green Woodpecker	46	—	46	482	—	14
Great Spotted Woodpecker	110	15	125	894	7	41
Wryneck	19	—	19	575	—	11
Woodlark	1	3	4	485	—	2
Skylark	467	272	739	9,165	4	61
Swallow	8,453	4,921	13,374	102,786	77	687
House Martin	2,081	31	2,112	22,745	16	168
Sand Martin	13,189	3	13,192	41,968	117	236
Raven	6	58	64	857	3	80
Carrion/Hooded Crow	21	109	130	3,752	13	229
Rook	247	247	494	10,037	33	641
Jackdaw	128	216	344	9,961	29	548
Magpie	51	121	172	3,192	11	139
Jay	110	60	170	1,965	15	144
Chough	12	17	29	271	3	13
Great Tit	4,982	2,467	7,449	58,433	159	995
Blue Tit	12,852	4,357	17,209	124,530	325	2,320
Coal Tit	399	168	567	7,077	9	92
Marsh Tit	373	74	447	2,635	4	24
Willow Tit	138	56	194	502	1	1
Long-tailed Tit	766	—	766	2,304	3	13

REPORT ON BIRD-RINGING FOR 1960

Ringed				Recovered		
	Juv./Adult	Pullus	1960 total	Grand total	1960	Grand total
carded Tit	362	—	362	603	5	5
uthatch	118	52	170	2,303	4	60
reecreper	243	67	310	1,893	—	3
ren	1,355	38	1,393	13,541	17	81
ipper	49	267	316	4,639	3	51
istle Thrush	425	209	634	10,475	27	293
eldfare	330	—	330	1,187	2	26
ong Thrush	5,746	2,163	7,909	124,556	295	3,164
edwing	2,197	5	2,202	7,704	12	76
ng Ouzel	60	62	122	1,688	2	28
ackbird	19,099	3,117	22,216	192,330	786	6,402
heatcar	1,205	368	1,573	15,748	6	68
onchat	342	58	400	2,940	7	21
hinchat	385	123	508	6,070	2	22
edstart	885	421	1,306	12,589	10	55
ack Redstart	52	—	52	609	1	14
ghtingale	86	32	118	3,571	—	13
uethroat	32	—	32	178	—	2
bin	7,366	661	8,027	78,288	170	1,824
asshopper Warbler	143	5	148	799	1	2
ed Warbler	935	89	1,024	5,226	9	25
dge Warbler	1,736	157	1,893	13,328	3	24
ackcap	809	65	874	4,519	5	21
erred Warbler	31	—	31	190	—	—
arden Warbler	575	48	623	5,022	—	7
itethroat	4,490	358	4,848	45,324	9	168
esser Whitethroat	361	37	398	2,801	3	13
rtford Warbler	1	15	16	105	—	—
llow Warbler	4,388	702	5,090	56,889	18	142
iffchaff	1,687	59	1,746	12,321	6	30
ood Warbler	7	50	57	2,206	—	11
lderest	714	—	714	5,727	1	8
cerest	53	—	53	204	—	—
otted Flycatcher	662	372	1,034	11,874	6	77
d Flycatcher	360	875	1,235	14,530	5	44
l-breasted Flycatcher	20	—	20	107	—	—
nnock	6,156	564	6,720	55,605	46	705
adow Pipit	3,317	406	3,723	25,905	35	214
e Pipit	144	69	213	3,792	—	6
ck/Water Pipit	632	30	662	7,787	7	52
l/White Wagtail	2,580	528	3,108	22,059	58	382
y Wagtail	117	85	202	2,645	2	15
low Wagtail ssp.	1,438	160	1,598	10,140	14	90
ewing	5	—	5	118	2	4
-backed Shrike	71	123	194	2,278	3	18
ling	20,237	988	21,225	274,281	1,121	10,809
vfinch	15	—	15	200	—	2
enfinch	13,871	291	14,162	93,648	277	1,539
elfinch	1,173	82	1,255	4,898	10	48
in	147	—	147	455	2	4
et	5,035	818	5,853	38,656	46	259
te	223	36	259	2,048	2	8
poll	463	13	476	2,005	5	22
finch	1,640	140	1,780	7,468	57	153
sbill	—	1	1	199	—	2
finch	7,262	364	7,626	84,372	84	951
nbling	817	—	817	4,682	4	30
owhammer	1,364	127	1,491	15,265	17	129

BRITISH BIRDS

		Ringed			Recovered		
		Juv./Adult	Pullus	1960 total	Grand total	1960	Grand total
Corn Bunting	.. ..	100	38	138	934	4	1
Girl Bunting	.. ..	8	—	8	171	—	—
Reed Bunting	.. ..	2,490	259	2,749	14,450	12	5
Snow Bunting	.. ..	513	—	513	2,622	10	1
House Sparrow	.. ..	15,943	794	16,737	101,693	262	1,43
Tree Sparrow	.. ..	3,956	426	4,382	15,554	12	6

SPECIES OF WHICH LESS THAN 100 HAVE BEEN RINGED

(1960 total, grand total, 1960 recoveries and grand total recoveries are given in that order)

Black-throated Diver	..	—	2	—	—	Western Sandpiper	..	—	1	—
Great Northern Diver	..	1	3	—	—	Buff-breasted Sandpiper	..	—	2	—
Red-throated Diver	..	2	8	—	3	Avocet	..	—	1	—
Great Crested Grebe	..	3	29	—	—	Grey Phalarope	..	18	26	—
Red-necked Grebe	..	—	1	—	—	Red-necked Phalarope	..	—	21	—
Slavonian Grebe	..	—	2	—	—	Glaucous Gull	..	1	5	—
Cory's Shearwater	..	1	1	—	—	Little Gull	..	—	1	—
Wilson's Petrel	..	—	2	—	—	Black Tern	..	—	1	—
Little Bittern	..	—	1	—	—	Gull-billed Tern	..	—	1	—
Bittern	..	—	33	—	6	Little Auk	..	1	16	—
Red-crested Pochard	..	—	16	—	4	Collared Dove	..	7	13	1
Scaup	..	2	27	2	8	Scops Owl	..	—	1	—
Mandarin Duck	..	—	2	—	—	Snowy Owl	..	—	1	—
Goldeneye	..	—	5	—	—	Hoopoe	..	1	8	—
Long-tailed Duck	..	—	3	—	—	Lesser Spotted Woodpecker	..	6	76	—
Velvet Scoter	..	1	2	—	1	Short-toed Lark	..	—	3	—
Common Scoter	..	1	13	—	2	Shore Lark	..	4	6	—
Red-breasted Merganser	..	—	15	—	1	Golden Oriole	..	—	1	—
Goosander	..	6	61	—	10	Crested Tit	..	1	51	—
Smew	..	—	2	—	—	Black-throated Thrush	..	—	1	—
Brent Goose	..	2	7	—	1	Dusky Thrush	..	1	1	—
Barnacle Goose	..	—	4	—	1	American Robin	..	—	1	—
Whooper Swan	..	—	4	—	2	Siberian Thrush	..	—	1	—
Kite	..	1	1	—	—	Gray-cheeked Thrush	..	—	2	—
Rough-legged Buzzard	..	1	1	—	—	Desert Wheatear	..	—	2	—
Golden Eagle	..	3	40	—	3	Black-eared Wheatear	..	—	1	—
Hobby	..	—	53	—	4	Pied Wheatear	..	—	1	—
Red-footed Falcon	..	—	1	—	—	Thrush Nightingale	..	—	2	—
Black Grouse	..	—	14	—	—	Lanceolated Warbler	..	1	2	—
Ptarmigan	..	—	2	—	—	Pallas's Grasshopper	..	—	—	—
Capercaillie	..	—	3	—	—	Warbler	..	—	1	—
Red-legged Partridge	..	2	72	—	12	Great Reed Warbler	..	—	1	—
Quail	..	1	5	—	—	Marsh Warbler	..	6	67	—
Pheasant	..	2	64	—	4	Paddyfield Warbler	..	—	1	—
Spotted Crake	..	—	8	—	—	Aquatic Warbler	..	3	20	—
Kentish Plover	..	—	1	—	—	Thick-billed Warbler	..	—	1	—
Grey Plover	..	23	66	—	2	Melodious Warbler	..	10	44	—
Dotterel	..	4	34	—	—	Icterine Warbler	..	12	83	—
Whimbrel	..	11	45	—	1	Olivaceous Warbler	..	—	3	—
Black-tailed Godwit	..	1	9	—	—	Booted Warbler	..	—	1	—
Bar-tailed Godwit	..	8	48	2	2	Orphean Warbler	..	—	1	—
Wood Sandpiper	..	26	75	1	1	Sardinian Warbler	..	—	1	—
Spotted Redshank	..	3	16	—	1	Subalpine Warbler	..	1	9	—
Greenshank	..	13	83	1	4	Greenish Warbler	..	4	14	—
Purple Sandpiper	..	27	97	—	—	Bonelli's Warbler	..	—	3	—
Temminck's Stint	..	—	3	—	—	Arctic Warbler	..	2	7	—
White-rumped Sandpiper	..	—	1	—	—	Yellow-browed Warbler	..	11	49	—
Pectoral Sandpiper	..	3	8	—	—	Pallas's Warbler	..	1	3	—

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Richard's Pipit	1	—	—	Baltimore Oriole	1	—	—
Lawn Pipit	2	—	—	Summer Tanager	1	—	—
Echona Pipit	1	—	—	Scarlet Grosbeak	6	26	—
Red-throated Pipit	1	—	—	Pine Grosbeak	1	—	—
Yellow-headed Wagtail	2	—	—	Black-headed Bunting	1	—	—
Great Grey Shrike	8	44	1	Red-headed Bunting	1	7	—
Lesser Grey Shrike	5	—	2	Yellow-breasted Bunting	2	—	—
Woodchat Shrike	5	34	—	Ortolan Bunting	22	—	—
Myrtle Warbler	1	1	—	Rustic Bunting	1	7	—
Yellowthroat	1	—	—	Little Bunting	2	11	—
Northern Waterthrush	1	—	—	Song Sparrow	1	—	—
Blue-coloured Junco	1	1	—	Lapland Bunting	14	59	—
Brown-coloured Starling	1	—	—				

Table 3

NUMBERS AND DISTRIBUTION OF RINGERS (as at 31.12.60)

ENGLAND					SCOTLAND				
County	Category of permit				County	Category of permit			
	A	B	C	Total		A	B	C	Total
Bedfordshire	2	—	—	2	Aberdeenshire	3	2	—	5
Berkshire	16	6	—	22	Ayrshire	2	—	—	2
Buckinghamshire	7	—	1	8	Berwickshire	1	—	—	1
Cambridgeshire	7	2	2	11	Dumfriesshire	2	—	—	2
Cheshire	18	—	10	28	East Lothian	1	—	—	1
Cornwall	2	—	—	2	Fife	3	—	—	3
Cumberland	3	—	1	4	Inverness-shire	5	—	2	7
Derbyshire	9	—	1	10	Kirkcudbright	3	—	—	3
Devonshire	6	1	1	8	Lanarkshire	1	—	—	1
Dorset	8	1	3	12	Midlothian	12	7	—	19
Durham	12	3	3	18	Orkney	1	—	—	1
Essex	42	5	7	54	Perthshire	1	—	—	1
Gloucestershire	12	1	3	16	Ross-shire	1	—	2	3
Hampshire	28	—	5	33	Shetland	—	3	—	3
Hertfordshire	3	—	—	3	Stirlingshire	2	—	—	2
Huffordshire	19	—	1	20	Sutherland	1	—	—	1
Leicestershire	42	5	4	51	Wigtownshire	1	—	—	1
Lincolnshire	22	—	2	24					
London	9	2	—	11					
Essex	7	2	4	13					
Gloucestershire	16	2	1	19					
Hampshire	15	—	7	22					
Hertfordshire	4	6	2	12					
Leicestershire	4	—	2	6					
Lincolnshire	5	5	2	12					
London	10	—	1	11					
Essex	13	2	6	21					
Gloucestershire	3	—	—	3					
Hampshire	12	—	3	15					
Hertfordshire	11	—	2	13					
Leicestershire	11	3	—	14					
Lincolnshire	46	3	3	52					
London	20	—	2	22					
Essex	24	2	1	27					
Gloucestershire	3	—	—	3					
Hampshire	9	—	—	9					
Hertfordshire	6	—	—	6					
Leicestershire	71	13	11	95					
Lincolnshire	2	—	—	2					

Selected list of recoveries reported during 1960

The following list is highly selective. To indicate the quantity and nature of the material omitted, the total number of recoveries is stated in brackets after the scientific name of each species, followed by the minimum movement to qualify for inclusion and the longest time lapsed between ringing and recovery. All foreign recoveries are either given in full or mentioned in the summaries. Species which produced only local recoveries are left out, but the individual totals thus omitted are listed in Table 2.

Key to symbols and terms

- Ring number: Where this is in italics the ring has been returned.
 Age: pull. (pullus)—nestling or chick, *not yet flying*;
 juv.—young, *able to fly freely*;
 1stW.—bird in its first winter;
 1stS.—bird in its first summer (one year old);
 f.g.—full-grown, age uncertain;
 ad.—adult; at least one year old.
 Sex: ♂—male;
 ♀—female.
 Manner of recovery: v—caught or trapped, and released with ring;
 +shot or killed by man;
 ×found dead or dying;
 ×A—found long dead;
 ()—caught or trapped alive and not released, or released but with ring removed;
 /?/—manner of recovery unknown.
 Date of recovery: Where this is unknown the date of the reporting letter is given in brackets.
 Distance: The distance, given in miles, and the directions are approximate.
 Arrangement of entry: Recoveries are arranged by species, and within the species usually by ringing locality from north to south. Ringing details are given on the first line and recovery data on the second.

Manx Shearwater (*Procellaria puffinus*) (87; 150 miles; 6 $\frac{9}{12}$ years)

AT41637	ad.	31.7.56	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	×	25.5.60	Sherkin (Cork) 175m. W.
3064502	ad.	8.4.59	Skokholm
	×	18.4.60	Freshfield, Formby (Lancashire) 155m. NE.
AT43636	ad.	4.5.57	Annet: 49°54'N. 6°02'W. Scilly SABO
	×	c. 28.7.60	Fairbourne (Merioneth) 215m. NE.
AT61204	ad.	16.8.58	Annet SABO
	×	5.7.60	Criccieth (Caernarvon) 225m. NNE.

In addition, 16 Manx Shearwaters were recovered in France (Finistère to Landes) and one in Spain (Santander), all between March and September. Three had been ringed on Annet, the remainder on Skokholm.

Fulmar (*Fulmarus glacialis*) (9; 100 miles; 3 years)

AT64608	pull.	7.8.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	()	23.9.60	off Murmansk: 69°26'N. 38°02'E. U.S.S.R.
3054731	pull.	14.8.58	Eynhallow: 59°08'N. 3°08'W. (Orkney) AU
	()	30.6.60	Dogger Bank: 54°30'N. 2°20'E. North Sea
AT33573	pull.	31.8.57	Sula Sgeir: 59°06'N. 6°10'W. Outer Hebrides JM
	×	summer 1960	near Lökken: 57°22'N. 9°44'E. (Jutland) Denmark

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T33882	pull. ()	7.8.55 early 2.57	Dwarwick Head: 58°37'N. 3°21'W. (Caithness) DMC Great Sole Bank: c. 49°30'N. 10°00'W. 700m. SSW.
T61818	ad. ()	23.6.59 (19.11.60)	Flannan Isles: 58°16'N. 7°35'W. Outer Hebrides TBB off Aberdeen c. 290m. ESE.
T58025	pull. v	20.8.58 18.5.60	The Shiant: 57°55'N. 6°20'W. Outer Hebrides MPMR off Norway: c. 66°00'N. 6°20'E.

Gannet (*Sula bassana*) (42; 200 miles; 6 $\frac{3}{12}$ years)

6727	pull. x	29.6.58 (7.11.60)	Sula Sgeir: 59°06'N. 6°10'W. Outer Hebrides TBB Dunbar (East Lothian) 250m. SE.
9992	pull. ()	3.8.57 4.6.60	Ailsa Craig: 55°13'N. 5°07'W. (Ayr) JAB off Iceland: 64°45'N. 10°40'W.

Birds ringed on the Bass Rock, 56°04'N. 2°38'W. (East Lothian), were recovered as follows:

Ringed			Recovered
888	9.8.56	0.4.60	Vierville: 49°23'N. 0°55'W. (Calvados) France
5015	2.7.57	(10.3.60)	near Dundalk (Louth) 200m. SW.
253	7.7.57	21.5.60	Walberswick (Suffolk) 310m. SE.
368	28.6.58	19.10.60	Hook of Holland: 51°59'N. 4°07'E. Netherlands
227	6.8.58	11.4.60	Walls, Sandness (Shetland) 285m. N.
0055	9.8.59	(26.2.60)	North Nesting, Mainland (Shetland) 295m. NNE.
496	17.8.60	(17.11.60)	Doolin, Lisdoonvarna (Clare) 340m. SW.

In addition, 13 Gannets were recovered outside British coastal waters, as summarised in Table A.

TABLE A—REGIONS AND MONTHS OF RECOVERIES OF GANNETS (*Sula bassana*)

Month of recovery	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
Gal	1	1	3	2	1	—	—	—	—	—	—	—
Africa	—	—	—	—	—	2	—	—	—	—	—	—
	—	—	—	—	—	1	—	—	1	—	—	—

E. Tables A-G are subject to error in cases where it has been necessary to assume that the month of recovery was approximately that of the letter reporting it, whereas the bird may have been recovered for some time before being found or reported. Records of this type are bracketed when they are the only ones for the months concerned but this treatment is not, of course, possible when there are several records for the same month.

Cormorant (*Phalacrocorax carbo*) (107; 100 miles; 13 $\frac{4}{12}$ years)

One moved more than 100 miles down the west coast, the most distant recovery being in Kintyre (275 miles). There were also six movements of more than 100 miles down the east coast, the most distant bird being at Berwick-on-Tweed (100 miles). One was recovered well inland at Loch Urquhart (Inverness).

West coast colonies

Birds ringed on the west coast were recovered on the east coast. Thirteen were recovered in NW France as follows: August, 4; September, 3; October, 2; November, 1; December, 2; and January, 1. Four were recovered in northern France, one each month from October to January.

East coast colonies

Three ringed on the east coast were recovered on the west coast. One from the Farne Islands (pull., 22.7.59) was recovered in Finistère in early January 1960.

In the following list the recovery locality for 137720 is well inland, while 5001348 and 5001472 are the only birds to have made a substantial movement northwards:

137720	pull.	28.6.60	Puffin Island: 53°19'N. 4°01'W. (Anglesey) MPH
	+	4.11.60	Le Mas Grenier: 43°53'N. 1°12'E. (Tarn-et-Garonne) France
5001348	pull.	21.5.60	Little Saltee: 52°07'N. 6°35'W. (Wexford) DC
	()	10.8.60	Lough Foyle (Londonderry) zoom. N.
5001472	pull.	21.5.60	Little Saltee DC
	()	6.9.60	Carnlough (Antrim) 195m. N.

Shag (*Phalacrocorax aristotelis*) (166; 4 $\frac{7}{12}$ years)

Recoveries involve birds from four main breeding areas. All the ones mentioned in the following summary were ringed as pulli unless it is expressly stated to the contrary.

Shetland/Orkney

11 recoveries at more than 100 miles, including:

Ringed		Recovered	
1009325	16.7.59	19.1.60	Fitjar: 59°55'N. 5°20'E. (Hordaland) Norway
1008038	7.6.59	12.3.60	Vlissingen: 51°27'N. 3°35'E. (Zeeland) Netherlands

The most distant recovery on the west coast was in South Uist on 5.3.60. On the east coast the furthest was at Bridlington (Yorkshire) on 21.10.60.

Forth/Farnes

35 recoveries at more than 100 miles, including:

Ringed		Recovered	
136446	28.6.59	29.12.59	Bredene: 51°14'N. 2°59'E. (West Flanders) Belgium
1004923	22.7.59	17.2.60	Baie de Somme: c. 50°12'N. 1°38'E. (Somme) France
1004933	22.7.59	28.2.60	Clabecq: 50°42'N. 4°14'E. (Brabant) Belgium
1004977	27.6.59	12.2.60	Eigeröy: 58°26'N. 5°55'E. (Rogaland) Norway

The most northerly recovery in British waters was in Harris, Outer Hebrides, on 2.4.60 and the most southerly was in the Isle of Wight on 27.2.60.

Irish Sea/Irish coasts

7 recoveries at more than 100 miles.

The most southerly recovery was a bird ringed as full-grown on Copeland on 30.8.59 and recovered near Queenstown (Cork) on 6.1.60. The most northerly was of a bird ringed in Co. Antrim on 3.7.56 and recovered on South Uist on 5.3.60.

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undy/Scilly

recoveries at more than 100 miles, including:

Ringed		Recovered	
WT 134*	30.5.57	7.2.60	Portsall: 48°33'N. 4°42'W. (Finistère) France
5430	27.6.57	6.1.60	Daoulas: 48°23'N. 4°23'W. (Finistère) France
99527	3.7.60	8.12.60	Brest: 48°23'N. 4°30'W. (Finistère) France
10761	30.6.60	16.11.60	L'Aber Wrach: 48°36'N. 4°35'W. (Finistère) France
10775	30.6.60	(10.10.60)	Ile de Sein: 48°02'N. 4°51'W. (Finistère) France
10791	30.6.60	30.9.60	Lesconil: 47°50'N. 4°14'W. (Finistère) France
13958	4.7.60	11.9.60	Roscoff: 48°43'N. 3°59'W. (Finistère) France
13981	4.7.60	(22.11.60)	Alderney: 49°43'N. 2°12'W. Channel Isles

*Ringed as adult.

the most northerly recovery was in Pembroke on 4.10.60, the most easterly in Burnemouth (Hampshire) on 14.9.60.

Heron (*Ardea cinerea*) (46; 150 miles; 7 $\frac{6}{12}$ years)
birds ringed as pulli at Denver, 52°35'N. 0°22'E., near Downham Market (Norfolk), were recovered as follows:

Ringed		Recovered	
620	27.4.59	14.1.60	near Tarbes: 43°14'N. 0°05'E. (Hautes-Pyrénées) France
623	27.4.59	(23.5.60)	near Preston (Lancashire) 150m. NW.
641	27.4.59	6.12.60	near Crickhowell (Breconshire) 150m. WSW.

Mallard (*Anas platyrhynchos*) (740; 8 $\frac{4}{12}$ years)

TABLE B—COUNTRIES AND MONTHS OF RECOVERIES OF MALLARD (<i>Anas platyrhynchos</i>)												
Country of recovery	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Belgium (15) and	—	—	—	2	1	—	2	3	2	2	3	—
Netherlands (23)	—	—	1	—	5	3	5	3	2	3	1	—
Denmark (23)	—	—	—	—	10	2	4	5	2	—	—	—
Germany (17)	—	—	—	2	4	1	4	1	2	—	—	—
France (6)	—	—	—	1	1	3	—	1	—	2	(1)	—
Italy (1) and	—	—	—	—	—	—	—	—	—	—	—	—
Sweden (22†)	—	1	—	—	8	5	6	2	—	—	—	—
Denmark (11)	1	1	—	—	6	3	—	—	—	—	—	—
Denmark (16) and	—	—	—	—	—	—	—	—	—	—	—	—
United States (4)	1	2	—	—	10	4	3	—	—	—	—	—

*Total includes one dated "January/February".

†Total includes one reported as "spring".

See footnote to Table A.

The birds in Table B were nearly all ringed between August and March, with following exceptions:

80	f.g.	30.7.59	Lower Peover: 53°16'N. 2°21'W. (Cheshire)
	+	(11.10.60)	Makkum: 53°03'N. 5°25'E. (Friesland) Netherlands
12	pull.	30.7.58	Slimbridge: 51°44'N. 2°25'W. (Gloucester)
	0=♂	29.6.59	Slimbridge
	transp.	1.7.59	Blagdon: 51°20'N. 2°43'W. (Somerset)
	+	22.10.60	Hornhuizen: 53°23'N. 6°22'E. (Groningen) Netherlands
7	f.g. ♂	16.5.58	Slimbridge
	+	11.8.60	near Älvkarleby: 60°35'N. 17°30'E. (Uppsala) Sweden

BRITISH BIRDS

Birds ringed at Abberton, 51°50'N. 0°53'E. (Essex), during the breeding season were recovered abroad as follows:

Ringed		Recovered	
944285	27.5.59	3.8.60	near Rees: 51°48'N. 6°22'E. (Nordrhein) Germany
944265*	14.6.59	23.10.60	near Kattarp: 56°07'N. 12°50'E. (Malmöhus) Sweden
AJ34081*	10.7.60	9.8.60	Naarden: 52°18'N. 5°10'E. (Noord-Holland) Netherlands
AJ34096	16.7.60	6.11.60	La Chapelle: 47°17'N. 1°19'W. (Loire-Atlantique) France
AJ28526	20.7.59	27.11.60	near Evron: 48°11'N. 0°25'W. (Mayenne) France
AJ28530	26.7.59	14.2.60	Herbignac: 47°28'N. 2°19'W. (Loire-Atlantique) France

*Ringed as adult male; the remainder were ringed as juveniles

Only 19 other birds showed movements of more than 100 miles.

Teal (*Anas crecca*) (586; 8- $\frac{6}{12}$ years)

3054197	pull.	9.7.59	South Uist: 57°15'N. 7°25'W. Outer Hebrides	RWJS
	+	24.12.60	Bansha (Tipperary) 325m. SSW.	
3007588	f.g. ♂	16.2.58	Peakirk: 52°38'N. 0°17'W. (Northampton)	
	+	(25.2.60)	Melara: 45°04'N. 11°13'E. (Rovigo) Italy	

Birds ringed at Abberton, 51°50'N. 0°53'E. (Essex), were recovered as follows:

Ringed		Recovered	
3008968*	28.9.56	5.1.60	near Sanlúcar: 36°46'N. 6°21'W. (Cádiz) Spain
3008424	11.1.56	3.9.56	De Koog: 53°06'N. 4°48'E. Texel Netherlands
		14.9.60	De Koog
3024456	28.10.57	5.10.58	Meetkerke: 51°14'N. 3°09'E. (West Flanders) Belgium
		20.10.60	Steeple: 51°43'N. 0°48'E. (Essex)
3041348	15.3.58	4.2.60	Cartaxo: 39°10'N. 8°47'W. (Ribatejo) Portugal
3058547	29.8.59	30.1.60	Peñarroya Pueblonuevo: 38°19'N. 5°16'W. (Córdoba) Spain
3058669	7.9.59	28.12.60	Marina di Ravenna: 44°29'N. 12°17'E. (Ravenna) Italy
3058743*	11.9.59	21.1.60	Suria: 41°51'N. 1°44'E. (Barcelona) Spain
2042035*	21.9.59	14.2.60	Calatayud: 41°21'N. 1°39'W. (Zaragoza) Spain
2045053*	25.10.59	15.1.60	near Torrão: 38°18'N. 8°13'W. (Baixo Alentejo) Portugal
2047049	24.11.59	17.3.60	Novara: 45°27'N. 8°37'E. (Novara) Italy
2050122*	22.1.60	16.10.60	Donada: 45°03'N. 12°13'E. (Rovigo) Italy

*Ringed as juvenile or first-winter; the remainder were ringed as adults

Table C summarises the records of 241 other Teal ringed in Britain outside the breeding season and recovered abroad.

TABLE C—COUNTRIES AND MONTHS OF RECOVERIES OF TEAL (*Anas crecca*)

Country of recovery	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
France (62*)	—	—	—	1	5	3	3	—	4	22	16	7
Belgium (11*)	—	—	—	—	—	—	2	1	—	1	4	—
Netherlands (30*)	—	—	—	—	6	6	4	2	2	1	7	—
Denmark (24*)	—	—	—	—	11	8	1	2	1	—	—	—
Germany (6)	—	—	—	—	2	—	2	—	1	1	—	—
Norway (5) and												
Sweden (15)	—	3	1	1	10	4	1	—	—	—	—	—
Finland (31)	3	9	3	—	14	4	—	—	—	—	—	—
U.S.S.R. (52*) and												
Baltic States (13*)	8	11	—	—	23	14	5	1	—	—	—	—

*Total includes undated record(s) omitted from monthly columns
See footnote to Table A

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Eleven movements of over 200 miles were recorded within Britain, and 36 birds marked in Britain were recovered in Ireland.

Garganey (*Anas querquedula*) (7; $4\frac{1}{12}$ years)

Birds ringed at Abberton, $51^{\circ}50'N$. $0^{\circ}53'E$. (Essex), were recovered as follows:

—Ringed—			—Recovered—	
7593*	5.8.55	20.3.60	Pazardzhik: $42^{\circ}12'N$. $24^{\circ}20'E$. (Plovdiv)	Bulgaria
24209	14.8.57	13.3.60	Biella: $45^{\circ}34'N$. $8^{\circ}04'E$. (Vercelli)	Italy
8154*	15.6.59	29.3.60	Dümmer See: $52^{\circ}30'N$. $8^{\circ}20'E$. (Niedersachsen)	Germany
8213	29.7.59	17.3.60	Somaglia: $45^{\circ}09'N$. $9^{\circ}38'E$. (Milano)	Italy
8249	10.8.59	12.3.60	Ravenna: $44^{\circ}25'N$. $12^{\circ}12'E$.	Italy
8235	9.8.59	15.8.60	Zametchino: $53^{\circ}29'N$. $42^{\circ}38'E$. (Penza)	U.S.S.R.
0567	17.6.60	4.9.60	near Arles: $43^{\circ}41'N$. $4^{\circ}38'E$. (Bouches-du-Rhône)	France

*Ringed as adult; the remainder were ringed as juveniles

The recovery dates of the first five birds throw an interesting sidelight on the timing of the spring migration.

Gadwall (*Anas strepera*) (10; 50 miles; $3\frac{8}{12}$ years)

2105	juv.	4.8.60	Sandringham: $52^{\circ}50'N$. $0^{\circ}31'E$. (Norfolk)	USA
	+	19.11.60	Schinnen: $50^{\circ}57'N$. $5^{\circ}54'E$. (Limburg)	Netherlands
085	f.g. ♀	8.1.57	Deeping St. James: $52^{\circ}40'N$. $0^{\circ}17'W$. (Lincoln)	
	+	c. 16.9.60	Welbeck, Worksop (Nottingham)	55m. NW.
2425	ad. ♂	21.1.60	Deeping St. James	
	+	5.8.60	Wolin: $53^{\circ}51'N$. $14^{\circ}38'E$. (Szczecin)	Poland
844	juv. ♂	30.8.60	Peakirk: $52^{\circ}38'N$. $0^{\circ}17'W$. (Northampton)	
	+	26.12.60	Baie des Veys: $49^{\circ}20'N$. $1^{\circ}10'W$. (Manche)	France

2105 was hand-reared.

Wigeon (*Anas penelope*) (30; $6\frac{3}{12}$ years)

813	ad. ♂	17.1.58	Abberton: $51^{\circ}50'N$. $0^{\circ}53'E$. (Essex)	
	+	28.2.60	Santander: $43^{\circ}28'N$. $3^{\circ}50'W$.	Spain
74	juv. ♂	8.9.55	Slimbridge: $51^{\circ}44'N$. $2^{\circ}25'W$. (Gloucester)	
	+	spring 1960	Rybnoe: $54^{\circ}45'N$. $39^{\circ}30'E$. (Ryazan)	U.S.S.R.

There are no previous recoveries of British-ringed birds in Spain. Fourteen other Wigeon ringed in England between December and February were recovered abroad, one in Denmark, two in France and eleven in the U.S.S.R.

Pintail (*Anas acuta*) (9; $5\frac{9}{12}$ years)

512	pull.	2.7.55	Killyleagh: $54^{\circ}24'N$. $5^{\circ}39'W$. (Down)	PPM
	+	1.9.60	Nisum Fjord: c. $56^{\circ}25'N$. $8^{\circ}10'E$. (Jutland)	Denmark
514	pull.	2.7.55	Killyleagh	PPM
	+	5.10.60	Broomfield, Virginia (Cavan)	68m. SW.
3	f.g. ♂	21.3.56	Deeping St. James: $52^{\circ}40'N$. $0^{\circ}17'W$. (Lincoln)	
	+	winter 1960/61	Vught: $51^{\circ}41'N$. $5^{\circ}15'E$. (Noord-Brabant)	Netherlands
5	f.g. ♀	27.11.52	Abberton: $51^{\circ}50'N$. $0^{\circ}53'E$. (Essex)	
	+	end 10.59	Lake Lubana: $56^{\circ}50'N$. $26^{\circ}40'E$.	Latvian S.S.R.
1	ad. ♂	2.1.56	Abberton	
	+	25.9.60	Ringkøbing Fjord: c. $56^{\circ}05'N$. $8^{\circ}15'E$. (Jutland)	Denmark
2	ad. ♂	29.12.53	Slimbridge: $51^{\circ}44'N$. $2^{\circ}25'W$. (Gloucester)	
	[?]	spring 1958	Sroda: $52^{\circ}15'N$. $17^{\circ}15'E$. (Poznan)	Poland

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935602	ad. ♀	5.1.54	Slimbridge
+		11.10.59	Liminganlahti: 64°51'N. 25°20'E. (Oulu) Finland
938876	f.g. ♂	6.1.56	Slimbridge
+		spring 1960	Shoyna: 67°51'N. 44°12'E. (Arkhangel) U.S.S.R.
3007223	1st W. ♂	25.11.56	Slimbridge
+		spring 1960	Saranpaul: 64°15'N. 62°54'E. (Tumen) U.S.S.R.

Shoveler (*Spatula chipeata*) (11; 10 miles; 5 $\frac{3}{12}$ years)

Birds ringed at Abberton, 51°50'N. 0°53'E. (Essex), were recovered as follows

Ringed			Recovered
151*	18.7.53	0.2.56	Urrugne: 43°23'N. 1°39'W. (Basses-Pyrénées) France
933038	8.5.59	0.10.60	Fielouse: 43°30'N. 4°38'E. (Bouches-du-Rhône) France
933042	1.6.59	(28.3.60)	Rencscure: 50°43'N. 2°25'E. (Nord) France
AT70918*	16.9.60	14.10.60	near Kampen: 52°36'N. 5°50'E. (Overijssel) Netherlands

*Ringed as pulli or juveniles; the remainder were ringed as full-grown

The following recoveries were of birds ringed at Slimbridge, 51°44'N. 2°25'W. (Gloucester):

Ringed			Recovered
939007*	7.8.54	end 11.59	Tijnje: 53°02'N. 6°00'E. (Friesland) Netherlands
919191	7.1.56	1.10.60	Nieuwerkerk: 51°58'N. 4°38'E. (Zuid-Holland) Netherlands
3007239*	12.12.57	19.5.60	Ust'-Tsilma: 65°26'N. 52°11'E. (Komi) U.S.S.R.
3007297	1.12.59	15.3.60	Baie de Somme: c. 50°13'N. 1°38'E. (Somme) France
AJ26031*	23.8.60	11.9.60	River Miño: c. 41°51'N. 8°52'W. (Pontevedra) Spain

*Ringed as pulli or juveniles; the remainder were ringed as full-grown

A recovery in Tarragona, Spain, for which not even the year of recovery is known has been omitted.

Tufted Duck (*Aythya fuligula*) (22; 10 miles; 9 $\frac{4}{12}$ years)

AF8984	f.g. ♀	14.3.59	near Haydon Bridge: 54°58'N. 2°14'W. (Northumberland) C&L.
	×	26.11.60	near Galston (Ayr) 90m. WNW.
932837	f.g. ♂	11.4.54	Abberton: 51°50'N. 0°53'E. (Essex)
+		9.5.60	Ust'-Kulom: 61°41'N. 53°40'E. (Komi) U.S.S.R.
933011	1st W. ♀	6.1.58	Abberton
+		spring 1960	Pechora: 65°10'N. 57°05'E. (Komi) U.S.S.R.
345297	ad. ♂	3.1.51	St. James's Park: 51°30'N. 0°08'W. (London) TLB
+		20.5.60	Ust'-Tsilma: 65°26'N. 52°11'E. (Komi) U.S.S.R.
3046351	ad. ♀	26.9.59	St. James's Park 11AB
+		0.9.60	Wąrnoleka: 53°40'N. 14°20'E. (Szczecin) Poland

Birds marked as full-grown at Deeping St. James, 52°40'N. 0°17'W. (Lincoln), were recovered as follows:

Ringed			Recovered
919091	2.9.57	11.5.60	Koslan: 63°28'N. 48°58'E. (Komi) U.S.S.R.
3007537	6.2.58	11.10.59	Rostov: 57°11'N. 39°26'E. (Yaroslav) U.S.S.R.
3042203	16.2.58	(13.1.60)	near Coagh (Tyrone) 285m. WNW.
3042209	16.2.58	3.7.60	Kaansoo: 58°35'N. 25°12'E. Estonian S.S.R.
3042210	16.2.58	10.5.60	Ivdel: 60°40'N. 60°23'E. (Sverdlovsk) U.S.S.R.
3042256	1.12.58	24.5.60	Leksand: 60°44'N. 15°00'E. (Kopparberg) Sweden

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42270	10.12.58	16.5.60	Pechora: 65°10'N. 57°05'E. (Komi) U.S.S.R.
42290	3.1.59	24.9.60	Yarensk: 62°12'N. 49°05'E. (Arkhangel) U.S.S.R.
42320	16.2.59	20.6.60	Miklavatn: 65°42'N. 19°35'W. (Skagafjörður) Iceland

42320 was the first British-ringed Tufted Duck to be recovered in Iceland, though several Icelandic-ringed ones have been recovered in Britain.

Scaup (<i>Aythya marila</i>) (1; 6½ years)			
2736	1st W. ♂	12.2.53	Abberton: 51°50'N. 0°53'E. (Essex)
	×	18.1.60	Travemünde: 53°57'N. 10°53'E. (Schleswig-Holstein) Germany

Pochard (<i>Aythya ferina</i>) (4; 3½ years)			
18935	f.g. ♂	26.12.56	Deeping St. James: 52°40'N. 0°17'W. (Lincoln)
	×	0.2.60	Great Haywood (Stafford) 80m. W.
4972	f.g. ♂	31.12.56	Deeping St. James
	+	20.10.59	Minsk: 53°51'N. 27°30'E. (Belorussia) U.S.S.R.
10024	f.g. ♂	5.2.57	Deeping St. James
	+	4.12.60	Ferrybridge (Dorset) 165m. SW.
28580	ad. ♂	31.8.59	Abberton: 51°50'N. 0°53'E. (Essex)
	+	20.1.60	St. Ciers: 45°18'N. 0°36'W. (Gironde) France

Eider (<i>Somateria mollissima</i>) (10; 10 miles; 2½ years)			
713	ad. ♀	25.6.60	Newburgh: 57°19'N. 2°01'W. (Aberdeen) AU
	+	26.12.60	Carnoustie (Angus) 62m. SW.
5708	ad. ♀	8.6.59	Farne Isles: 55°37'N. 1°37'W. (Northumberland)
	×	4.6.60	Granton (Midlothian) 65m. WNW.
5723	ad. ♀	8.6.59	Farne Isles
	()	24.2.60	Inchkeith (Fife) 62m. WNW.

Shelduck (<i>Tadorna tadorna</i>) (11; 5 miles; 4½ years)			
5428	juv.	31.8.60	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC
	×	13.9.60	Terrington Marsh, King's Lynn (Norfolk) 65m. WNW.
227	pull.	25.7.56	Poole Harbour: 50°42'N. 2°00'W. (Dorset) BS
	× A	(23.12.60)	near Saltfleet (Lincoln) 205m. NNE.

Grey Lag Goose (<i>Anser anser</i>) (19; 150 miles; 8½ years)			
32	1st W.	14.11.53	(Kinross)
	× A	29.5.60	Skeidarársundur: 63°47'N. 17°18'W. East Skaftafellsýsla, Iceland

White-fronted Goose (<i>Anser albifrons</i>) (12; 9½ years)			
birds ringed at Slimbridge, 51°44'N. 2°25'W. (Gloucester), were recovered as follows:			

Ringed		Recovered	
6	27.2.50	21.1.60	Moerdijk: 51°42'N. 4°38'E. (Noord-Brabant) Netherlands
13	21.2.58	20.1.60	Klundert: 51°41'N. 4°33'E. (Noord-Brabant) Netherlands
56	21.2.58	11.11.60	Grimmen: 54°05'N. 13°15'E. (Mecklenburg) Germany
6	21.2.58	18.1.60	Willemstad: 51°41'N. 4°27'E. (Noord-Brabant) Netherlands
96	4.3.58	8.2.60	near Bitola: 41°03'N. 21°21'E. (Macedonia) Yugoslavia
22	4.3.58	29.1.59	Vlijmen: 51°42'N. 5°14'E. (Noord-Brabant) Netherlands
24	4.3.58	5.2.60	near Lelystad: c. 52°30'N. 5°30'E. (Oost-Flevoland) Netherlands
59	9.3.59	(24.1.60)	Glückstadt: 53°47'N. 9°26'E. (Schleswig-Holstein) Germany

SWT372	9.3.59	0.5.60	Kolguev: <i>c.</i> 69°00'N. 48°30'E. U.S.S.R.
SWT406	9.3.59	5.10.60	Ryazan: 54°38'N. 39°45'E. U.S.S.R.
1007205	9.3.59	30.1.60	Bunschoten: 52°14'N. 5°22'E. (Utrecht) Netherlands
1007353	9.3.59	22.4.60	Ukholovo: 53°47'N. 40°29'E. (Ryazan) U.S.S.R.

SWT296 is the first recovery of a British-ringed White-fronted Goose in south eastern Europe.

Pink-footed Goose (*Anser arvensis brachyrhynchus*) (286; 10 years)

Three ringed in Britain were recovered in Iceland between April and September and one was recovered at Hurry Inlet, *c.* 70°30'N. 22°00'W., East Greenland, on 15.6.60. Of 282 birds recovered on the wintering grounds in Britain, six had been ringed originally in central Iceland in 1953 and subsequently retrapped in Britain

Canada Goose (*Branta canadensis*) (20; 100 miles; 6 $\frac{8}{12}$ years)

135942	ad.	21.6.57	Osmaston: 52°59'N. 1°43'W. (Derby)
	transp.	21.6.57	Rivington: 53°38'N. 2°34'W. (Lancashire)
	()	0.8.60	Holbeach Marsh (Lincoln) 120m. ESE.

Mute Swan (*Cygnus olor*) (166; 40 miles; 3 $\frac{8}{12}$ years)

Z1819	ad.	3.9.60	Hornsea Mere: 53°55'N. 0°10'W. (York) GRB
	v	6.10.60	Cambridge 120m. S.
Z1299	1stS.	31.5.60	Cambridge CMR
	v	4.9.60	Hornsea Mere (York) 120m. N.

Birds ringed as full-grown at Abberton, 51°50'N. 0°53'E. (Essex), were recovered as follows:

Ringed		Recovered	
YB1365	27.7.57	10.4.60	Cambridge 40m. NW.
		29.6.60	Cambridge
YB044	26.7.57	(6.2.60)	Earith (Huntingdon) 50m. NW.
YB1797	20.8.58	4.3.60	Cambridge 40m. NW.
YB1566	30.5.59	27.4.60	Cambridge 40m. NW.
YB1754	19.8.58	(3.6.60)	Upware (Cambridge) 40m. NW.

Buzzard (*Buteo buteo*) (5; 50 miles; 1 $\frac{9}{12}$ year)

AH8532	pull.	28.6.60	Cartmel: 54°12'N. 2°57'W. (Lancashire) JWA
	+	<i>c.</i> 20.9.60	Newton-le-Willows (Lancashire) 55m. SSE.

Hen Harrier (*Circus cyaneus*) (3; 50 miles; 1 $\frac{11}{12}$ years)

3051477	pull. ♀	2.7.59	Birsay: 59°08'N. 3°18'W. Mainland (Orkney) EB
	×	<i>c.</i> 15.3.60	Doune (Perth) 200m. SSW.

Montagu's Harrier (*Circus pygargus*) (2; 50 miles; 7 $\frac{1}{12}$ years)

361086	pull.	6.7.53	Dartmoor (Devon) HGH
	+	30.8.60	Créon: 44°47'N. 0°20'W. (Gironde) France

Kestrel (*Niæco tinnunculus*) (24; 100 miles; 3 $\frac{2}{12}$ years)

2020913	1stW. ♀	12.10.60	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	×	(8.12.60)	Mastenbroek Polder: <i>c.</i> 52°35'N. 6°00'E. (Overijssel) Netherlands

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5562	pull. ×	28.6.59 c. 1.2.60	near Sedbergh: 54°19'N. 2°32'W. (York) SS Knowle (Warwick) 130m. SSE.
5563	pull. ×	28.6.59 (15.2.60)	near Sedbergh SS Sauvignac: 45°17'N. 0°04'W. (Charente) France
5555	juv. ()	15.8.58 1.2.60	Hornsea: 53°53'N. 0°11'W. (York) GB Cerfontaine: 50°10'N. 4°25'E. (Namur) Belgium
5917	pull. ×	26.6.59 27.1.60	near Hinckley: 52°34'N. 1°21'W. (Leicester) HL Pitton, Salisbury (Wiltshire) 100m. S.
4466	ad. ♀ ×	13.9.60 24.12.60	Great Saltee: 52°07'N. 6°35'W. (Wexford) Bridgend (Glamorgan) 135m. ESE.
5130	f.g. ×	25.7.60 6.8.60	Elm Park: 51°33'N. 0°12'E. Romford (Essex) RRS Hythe (Kent) 50m. SE.

Water Rail (*Rallus aquaticus*) (3; 5 miles; 1½ years)

507	f.g. +	5.10.59 26.12.60	Abberton: 51°50'N. 0°53'E. (Essex) near Dunkirk: 51°02'N. 2°23'E. (Nord) France
5573	f.g. ×	22.2.59 4.3.60	Leatherhead: 51°18'N. 0°20'W. (Surrey) CE&Q Pfaffenhoffen: 48°51'N. 7°37'E. (Bas-Rhin) France

Coot (*Fulica atra*) (15; 100 miles; 4½ years)

754	f.g. ×	19.12.57 2.9.60	Abberton: 51°50'N. 0°53'E. (Essex) Barnard Castle (Durham) 220m. NW.
5068	f.g. ♂ +	19.2.60 18.9.60	Slimbridge: 51°44'N. 2°25'W. (Gloucester) Ringkøbing Fjord: c. 56°00'N. 8°15'E. (Jutland) Denmark
5074	f.g. +	19.2.60 10.8.60	Slimbridge Poulsker: 55°04'N. 15°09'E. (Bornholm) Denmark
5097	f.g. transp. ×	19.2.60 20.2.60 25.6.60	Slimbridge Salisbury: 51°04'N. 1°47'W. (Wiltshire) near Bridgnorth (Shropshire) 100m. NNW.

Oystercatcher (*Haematopus ostralegus*) (15; 100 miles; 7½ years)

532	pull. ×	9.7.56 12.12.60	Kingussie: 57°05'N. 4°04'W. (Inverness) RP Douglas (Cork) 400m. SW.
501	pull. [?]	23.6.59 4.10.59	Burial Island: 54°29'N. 5°26'W. (Down) CBO near La Guardia: 41°54'N. 8°53'W. (Pontevedra) Spain

Lapwing (*Vanellus vanellus*) (49; 8½ years)

5	pull. +	1.6.57 6.5.60	near Consett: 54°52'N. 1°56'W. (Durham) JCC Sokol: 59°28'N. 40°10'E. (Vologda) U.S.S.R.
5	pull. [?]	3.6.51 7.2.60	near Clitheroe: 53°53'N. 2°24'W. (Lancashire) JJB Tiflet: 35°54'N. 6°18'W. Morocco
5	ad. +	8.7.55 22.2.60	Abberton: 51°50'N. 0°53'E. (Essex) Bibbona: 43°16'N. 10°36'E. (Livorno) Italy
5	ad. × A	26.9.56 10.4.60	Wallingford: 51°37'N. 1°08'W. (Berkshire) OOS Czechowice: 49°55'N. 19°01'E. (Stalinogród) Poland

5 birds ringed in southern England were recovered in north-west France between November and January, one from Lancashire was reported in Portugal in February, one Hampshire bird was found in northern Spain in January. Seven ringed in southern England and the north of England were recovered in Ireland during the winter.

Ringed Plover (*Charadrius hiaticula*) (8; 50 miles; $6\frac{8}{12}$ years)

X43546	juv.	6.8.53	Fortrose: $57^{\circ}34'N$. $4^{\circ}09'W$. (Ross) JL
	×	5.4.60	Sanday (Orkney) 130m. NNE.
I'52045	1stW.	12.9.57	Seahouses: $55^{\circ}35'N$. $1^{\circ}39'W$. (Northumberland) MHBO
	+	2.5.60	Baie de Somme: $50^{\circ}11'N$. $1^{\circ}43'E$. (Somme) France
S67754	pull.	18.6.59	Rathlin: $55^{\circ}18'N$. $6^{\circ}12'W$. (Antrim) JVB
	×	8.5.60	Great Copeland (Down) 50m. SE.
60395X	1stW.	5.9.60	St. Agnes: $49^{\circ}53'N$. $6^{\circ}12'W$. Scilly SABO
	+	3.10.60	Laredo: $43^{\circ}24'N$. $3^{\circ}24'W$. (Santander) Spain

Golden Plover (*Charadrius apricarius*) (2; 50 miles; $2\frac{7}{12}$ years)

299832	pull.	18.6.57	Allenheads: $54^{\circ}48'N$. $2^{\circ}13'W$. (Northumberland) A&R
	+	(12.1.60)	Stanley, Wakefield (York) 80m. SSE.

Snipe (*Gallinago gallinago*) (21; 100 miles; $10\frac{3}{12}$ years)

R51740	pull.	12.6.60	Gooderstone: $52^{\circ}34'N$. $0^{\circ}44'E$. (Norfolk) CIBO
	×	6.8.60	Jublains: $48^{\circ}15'N$. $0^{\circ}29'W$. (Mayenne) France
R43650	f.g.	27.8.59	Ely: $52^{\circ}24'N$. $0^{\circ}16'E$. (Cambridge) AEV
	×	(6.10.60)	Glenluce (Wigtown) 265m. NW.
R25369	f.g.	22.11.58	Oxford: $51^{\circ}45'N$. $1^{\circ}16'W$. NH
	+	30.1.60	Chapel Amble (Cornwall) 175m. WSW.
R51485	f.g.	15.2.59	Elmers End: $51^{\circ}24'N$. $0^{\circ}03'W$. Beckenham (Kent) HPM
	+	15.8.60	Dno: $57^{\circ}50'N$. $29^{\circ}59'E$. (Pskov) U.S.S.R.

Birds ringed as full-grown at Abberton, $51^{\circ}50'N$. $0^{\circ}53'E$. (Essex), were recovered as follows:

Ringed		Recovered	
SR042	25.10.49	13.1.60	near Salisbury (Wiltshire) 120m. WSW.
V58545	9.9.58	27.1.60	Lanarth (Cornwall) 280m. WSW.
I'58559	17.9.58	1.7.60	near Otley (York) 180m. NW.
I'58573	3.10.58	16.1.60	Tarnos: $43^{\circ}33'N$. $1^{\circ}27'W$. (Landes) France
I'58659	26.2.59	31.1.60	Puys: $49^{\circ}55'N$. $1^{\circ}10'E$. (Seine-Maritime) France

Woodcock (*Scolopax rusticola*) (3; 10 miles; $2\frac{7}{12}$ years)

2006059	pull.	15.6.58	Hamsterley: $54^{\circ}41'N$. $1^{\circ}49'W$. (Durham) ND&N
	+	31.1.60	Lepertown (Waterford) 270m. SW.
2013521	f.g.	23.10.60	Romford: $51^{\circ}35'N$. $0^{\circ}11'E$. (Essex) CEJC
	+	24.11.60	Ferns (Wexford) 290m. WNW.

Curlew (*Numenius arquata*) (14; 50 miles; $8\frac{10}{12}$ years)

3018814	pull.	5.7.58	Slaidburn: $54^{\circ}00'N$. $2^{\circ}30'W$. (York) I&R
	/P/	6.2.60	R. Dee (Flint) c. 55m. SSW.

Bar-tailed Godwit (*Limosa lapponica*) (1; $3\frac{9}{12}$ years)

281716	1stW.	7.9.56	Fair Isle: $59^{\circ}32'N$. $1^{\circ}37'W$. (Shetland)
	+	2.6.60	Noril'sk: $69^{\circ}20'N$. $88^{\circ}10'E$. (Krasnoyarsk) U.S.S.R.

Wood Sandpiper (*Tringa glareola*) (1; 11 days)

R22878	f.g.	10.8.60	Tetney Marsh: $53^{\circ}29'N$. $0^{\circ}01'W$. (Lincoln) RKN
	v	20.8.60	near Wisbech (Cambridge) 55m. S.

Common Sandpiper (*Tringa hypoleucos*) (3; 5 miles; 5 $\frac{1}{12}$ years)

2415	f.g. ×	27.7.55 (9.8.60)	Abberton: 51°50'N. 0°53'E. (Essex) Ortnevik: 61°06'N. 6°08'E. (Sogn-og-Fjordane) Norway
113	ad. +	27.4.60 20.8.60	Guildford: 51°14'N. 0°35'W. (Surrey) GRG near Arroyo de San Serván: 38°51'N. 6°33'W. (Badajóz) Spain

Redshank (*Tringa totanus*) (13; 50 miles; 3 $\frac{7}{12}$ years)

377	pull. +	21.6.56 30.1.60	near Penicuik: 55°50'N. 3°14'W. (Midlothian) MOC Eastriggs, Annan (Dumfries) 57m. S.
189	pull. +	18.5.60 11.11.60	near Burnley: 53°48'N. 2°14'W. (Lancashire) CO Arvert: 45°44'N. 1°08'W. (Charente-Maritime) France
189	pull. +	16.6.60 15.8.60	Marston: 52°59'N. 0°41'W. (Lincoln) WMP Baie de Somme: c. 50°13'N. 1°38'E. (Somme) France
290	f.g. × A	1.9.58 (5.7.60)	Holbeach Marsh: 52°54'N. 0°02'E. (Lincoln) C&PM near Easingwold (York) 100m. NW.
269	pull. +	25.5.60 29.10.60	Scolt Head: 52°59'N. 0°45'E. (Norfolk) EAGD Baie de Pénérff: 47°32'N. 2°34'W. (Morbihan) France
162	1stW. ×	18.8.59 (2.7.60)	Terrington Marsh: 52°47'N. 0°20'E. (Norfolk) WWRG near Scunthorpe (Lincoln) 75m. NW.

Knot (*Calidris canutus*) (1; 3 $\frac{1}{12}$ years)

108	juv. +	12.9.56 2.1.60	South Uist: 57°15'N. 7°28'W. Outer Hebrides H&M Baie de l'Aiguillon: 46°17'N. 1°12'W. (Charente-Maritime) France
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Little Stint (*Calidris minuta*) (3; $\frac{2}{12}$ year)

4X	f.g. +	25.9.60 16.10.60	near Hawarden: 53°12'N. 3°02'W. (Flint) RPC Anglet: 43°29'N. 1°30'W. (Basses-Pyrénées) France
72	f.g. +	18.9.60 22.11.60	Foulness: 51°36'N. 0°55'E. (Essex) PR Albal: 39°25'N. 0°25'W. (Valencia) Spain
8X	f.g. ×	22.9.60 23.10.60	Midrips: 50°56'N. 0°55'E. Rye (Sussex) DBO Nieulle sur Seudre: 45°45'N. 1°00'W. (Charente-Maritime) France

All three were ringed within a few days of each other, at a time when exceptional numbers of Little Stints were passing through Britain (*Brit. Birds*, 53: 531-533).

Dunlin (*Calidris alpina*) (21; 10 miles; 3 $\frac{7}{12}$ years)

110	ad. +	2.9.57 12.5.60	Holy Island: 55°42'N. 1°48'W. (Northumberland) MHBO Bouin: 46°59'N. 2°00'W. (Vendée) France
62	1stW. +	23.8.56 end 3.60	Seahouses: 55°35'N. 1°39'W. (Northumberland) MHBO Ile aux Oiseaux: 44°42'N. 1°12'W. Arcachon (Gironde) France
74	f.g. v	2.8.57 9.4.60	Seahouses MHBO Knokke: 51°21'N. 3°19'E. (West Flanders) Belgium
13X	f.g. +	29.8.60 3.9.60	Langness: 54°03'N. 4°37'W. Isle of Man GDC Mesquer: 47°24'N. 2°29'W. (Loire-Atlantique) France
68	f.g. ×	9.9.59 c. 27.7.60	R. Humber estuary: 53°41'N. 0°10'W. (York) DJM North Sea, between Ostend and Grimsby.
4X	ad. /?/	7.10.60 25.12.60	Spurn Point: 53°35'N. 0°06'E. (York) R. Gironde: c. 45°30'N. 1°00'W. France
73	ad. v	18.8.59 23.4.60	Terrington Marsh: 52°47'N. 0°20'E. (Norfolk) WWRG Midrips, Rye (Sussex) 125m. SSE.

R50900	ad.	20.3.60	East Tilbury: 51°28'N. 0°26'E. (Essex) ABO
	+	11.9.60	Alrö: 55°52'N. 10°04'E. (Jutland) Denmark
04756X	f.g.	6.8.60	near Lydd: 50°57'N. 0°55'E. (Kent) DBO
	+	10.8.60	Baie d'Ouistreham: 49°16'N. 0°15'W. (Calvados) France
600145	f.g.	27.8.58	Midrips: 50°56'N. 0°55'E. Rye (Sussex) DBO
	+	(12.9.60)	Baie d'Aiguillon: 46°20'N. 1°10'W. (Charente-Maritime) France

Ruff (*Philomachus pugnax*) (4; 20 miles; 1 $\frac{11}{12}$ years)

R16165	f.g. ♀	1.9.58	Bamburgh: 55°36'N. 1°42'W. (Northumberland) MHBO
	+	13.8.60	Villeneuve: 43°32'N. 3°52'E. (Hérault) France
R51949	f.g. ♂	30.8.59	Cley: 52°58'N. 1°03'E. (Norfolk) CIBO
	()	3.6.60	Naryan-Mar: 67°37'N. 53°00'E. (Arkhangel) U.S.S.R.
R40613	f.g. ♀	4.9.58	near Wisbech: 52°44'N. 0°11'E. (Cambridge) AEV
	+	22.3.60	Vicarello: 43°37'N. 10°28'E. (Livorno) Italy

Arctic Skua (*Stercorarius parasiticus*) (4; 5 miles; 1 $\frac{2}{12}$ year)

3075650	pull.	5.7.60	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	[?]	0.8.60	Algiers: 36°50'N. 3°00'E. Algeria
3075742	pull.	9.7.60	Fair Isle
	v	25.8.60	Kincardine: 56°03'N. 3°43'W. (Fife) 250m. SSW.

3075650 is the first British-ringed Arctic Skua to be recovered in the Mediterranean.

Great Skua (*Catbaracta skua*) (5; 5 miles; 1 $\frac{9}{12}$ years)

410969	pull.	22.6.58	Noss: 60°08'N. 1°05'W. (Shetland) WJE
	×	16.3.60	Harlington, Mexborough (York) 450m. S.
413866	pull.	15.7.59	Foula: 60°08'N. 2°05'W. (Shetland) DRW
	()	8.11.60	Bay of Biscay: 45°10'N. 2°35'W.
415620	pull.	29.7.60	Foula JCG
	v	22.10.60	Sanday (Orkney) 63m. SSW.
415410	pull.	30.7.60	Foula EEJ
	+	(2.11.60)	Nazaré: 39°36'N. 9°04'W. (Estremadura) Portugal
AJ4806	pull.	7.8.60	Foula JCG
	× A	13.10.60	Tore, Black Isle (Ross) 195m. SW.

Although the date and the recovery locality for 410969 are surprising, Harlington being well inland, the return of the ring and the finder's description of the bird leave no room for doubt.

Great Black-backed Gull (*Larus marinus*) (32: 200; 8 $\frac{9}{12}$ years)

412688	pull.	10.7.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	×	29.9.60	Terneuzen: 51°20'N. 3°50'E. (Zeeland) Netherlands
AT64624	1st W.	2.11.59	Fair Isle
	×	12.7.60	Skomer (Pembroke) 550m. SSW.
413045	pull.	27.6.58	North Rona: 59°08'N. 5°50'W. Outer Hebrides TBB
		(16.5.60)	Carradale Bay (Argyll) 240m. S.
413134	pull.	21.7.58	North Rona TBB
	>	1.9.60	near Whitley Bay (Northumberland) 325m. SE.
412902	pull.	4.7.59	Handa: 58°23'N. 5°11'W. (Sutherland) MPH
	+	5.6.60	Whitley Bay (Northumberland) 270m. SE.
412905	pull.	5.7.59	Handa MPH
		23.1.60	Strangford Lough, Northern Ireland c. 270m. S.

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110879	1st S.	9.4.56	Isle of May: 56° 11' N. 2° 33' W. (Fife)
×		2.11.59	Venö: 56° 33' N. 8° 38' E. (Jutland) Denmark

Lesser Black-backed Gull (*Larus fuscus*) (75; 5 $\frac{1}{2}$ years)

146962	pull.	7.8.59	Farne Islands: 55° 37' N. 1° 37' W. (Northumberland)
×		18.11.59	Mindelo: 41° 18' N. 8° 44' W. (Douro Litoral) Portugal
×		14.12.60	Viana do Castelo: 41° 41' N. 8° 50' W. (Minho) Portugal

The remaining 39 foreign recoveries conform closely to the known winter distribution of this species and are summarised in Table D.

TABLE D—REGIONS AND MONTHS OF RECOVERIES OF LESSER BLACK-BACKED GULLS (*Larus fuscus*)

Region of recovery	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Channel and Biscay	3	2	2	1	1	-	-	-	-	1	-	-
Spain* and Portugal	-	6	8	5	1	1	-	-	-	-	-	1
Mediterranean	-	(1)	-	-	1	-	-	-	-	-	-	-
Sicocco	-	-	-	-	2	1	-	-	1	-	-	-

*One reported as "winter" See footnote to Table A

Herring Gull (*Larus argentatus*) (179; 200 miles; 7 $\frac{1}{2}$ years)

122374	pull.	15.7.59	near Nigg: 57° 44' N. 3° 54' W. (Ross) JL
×		12.3.60	Washington (Durham) 215m. SE.
122341	pull.	29.7.59	Rosemarkie: 57° 36' N. 4° 07' W. (Ross) JL
×		5.6.60	Haslingden (Lancashire) 270m. SSE.
111479	pull.	22.6.60	Berneray: 56° 47' N. 7° 38' W. Outer Hebrides DRW
×		(30.12.60)	Manchester (Lancashire) 300m. SE.
11637	juv.	30.8.57	Isle of May: 56° 11' N. 2° 33' W. (Fife)
×		4.1.60	Thompson, Watton (Norfolk) 280m. SE.
111885	pull.	23.6.59	Bass Rock: 56° 04' N. 2° 38' W. (East Lothian) MHBO
×		7.8.60	Terrington Marsh (Lincoln) 245m. SSE.
112950	pull.	4.7.59	Ballycastle: 55° 12' N. 6° 15' W. (Antrim) JAB
×		20.4.60	Sale (Cheshire) 200m. SE.
120647	pull.	10.7.59	Calf of Man: 54° 03' N. 4° 49' W. CMRS
()		15.7.60	Schull (Cork) 260m. SW.

Common Gull (*Larus canus*) (12; 100 miles; 5 $\frac{1}{2}$ years)

112604	pull.	27.6.59	Copeland: 54° 40' N. 5° 32' W. (Down)
×	A	(8.3.60)	Limerick 185m. SW.
0111	pull.	13.7.57	Great Blasket: 52° 05' N. 10° 32' W. (Kerry) DFC
+		10.9.57	Betanzos: 43° 17' N. 8° 13' W. (Coruña) Spain
1347	1st W.	18.2.56	Chelmsford: 51° 44' N. 0° 28' E. (Essex) P&B
+		0.7.59	Kunila: 58° 37' N. 23° 49' E. Estonian S.S.R.
10281	ad.	19.2.56	Sandwich: 51° 17' N. 1° 20' E. (Kent) DFH
()		30.9.60	Andöy: 69° 19' N. 16° 08' E. (Nordland) Norway

Black-headed Gull (*Larus ridibundus*) (218; 11 $\frac{1}{2}$ years)

0618	pull.	26.6.57	Ravenglass: 54° 21' N. 3° 25' W. (Cumberland) ROMF
×		20.5.60	Melhus: 63° 17' N. 10° 18' E. (Sör-Tröndelag) Norway
134	ad.	29.2.56	Abberton: 51° 50' N. 0° 53' E. (Essex)
×		(8.7.60)	Wezel: 51° 12' N. 5° 13' E. (Antwerp) Belgium

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393333	1st W. +	12.2.56 4.6.60	Chelmsford: 51°44'N. 0°28'E. (Essex) P&B Adelsö: 59°20'N. 17°35'E. (Stockholm) Sweden
3031276	pull. ×	16.6.57 16.5.60	Stoke: 51°37'N. 0°38'E. (Kent) F&M near Aasted: 56°47'N. 9°00'E. (Jutland) Denmark
3010285	ad. ×	19.2.56 1.6.60	Sandwich: 51°17'N. 1°20'E. (Kent) DFH Grindsted: 55°46'N. 8°56'E. (Jutland) Denmark
3018077	ad. ×	25.2.60 early 6.60	Dungeness: 50°55'N. 0°59'E. (Kent) Karlsbad: 50°14'N. 12°53'E. Czechoslovakia

Adults ringed in St. James's Park and on Westminster Embankment, 51°30'N. 0°08'W., central London, were recovered as follows:

Ringed		Recovered	
368670	2.12.52	0.6.60	near Hanko: 59°50'N. 23°00'E. (Uusimaa) Finland
3051150	28.1.59	8.5.60	Zoutkamp: 53°20'N. 6°18'E. (Groningen) Netherlands
3044905	27.10.59	14.6.60	Chocen: 50°00'N. 16°10'E. (Pardubice) Czechoslovakia
3044948	1.3.60	(16.7.60)	Aarup: 55°23'N. 10°03'E. (Fyn) Denmark

Three birds ringed as pulli in the southern half of England were recovered in Spain, Portugal and the Netherlands, in December, January and February respectively. Sixteen movements over distances of 100-300 miles within the British Isles show fairly random dispersal.

Kittiwake (*Rissa tridactyla*) (46; 200 miles; 5 $\frac{10}{12}$ years)

2028333	pull. ×	6.7.59 (30.12.60)	Dunbar: 56°00'N. 2°31'W. (East Lothian) JCC near Torrelavega: 43°20'N. 4°11'W. (Santander) Spain
3068811	pull. v	4.7.59 4.6.60	Ballycastle: 55°12'N. 6°15'W. (Antrim) JAB off Eddystone Lighthouse, Plymouth (Devon) 345m. SSE.
2020004	ad. ×	22.6.59 20.2.60	North Shields: 55°01'N. 1°26'W. (Northumberland) JCC Maryport (Cumberland) 83m. WSW.
2021615	pull. ×	c. 20.6.59 29.12.60	North Shields ND&N Heads of Ayr (Ayr) 120m. W.
3054966	2nd W. ×	4.9.58 20.5.60	South Shields: 55°00'N. 1°25'W. (Durham) JCC Terschelling: 53°25'N. 5°20'E. Frisian Islands Netherlands

Birds ringed on the Farne Islands, 55°37'N. 1°37'W. (Northumberland), were recovered as follows:

Ringed		Recovered	
AT42767*	27.6.56	4.6.60	Brancaaster (Norfolk) 200m. SSE
3022122*	15.6.57	(11.5.60)	off Les Sables d'Olonne: 46°30'N. 1°47'W. (Vendée) France
3023821	6.7.57	20.4.60	Westenschouwen: 51°41'N. 3°41'E. (Zeeland) Netherlands
AT51330*	23.6.58	15.3.60	Terschelling, Netherlands
2021327	27.6.59	(8.8.60)	Ballyvaughan (Clare) 340m. WSW.
2021410	27.6.59	10.5.60	Sandettie Lightship: 51°13'N. 1°54'E. France
2021411	27.6.59	17.5.60	off Change Island: 49°37'N. 54°23'W. Fogo, Newfoundland
2021430	27.6.59	0.3.60	near Knokke: 51°20'N. 3°14'E. (West Flanders) Belgium
2021483	27.6.59	5.5.60	Rindby: 55°26'N. 8°25'E. (Jutland) Denmark
2021873	27.6.59	(4.1.60)	Sylt: c. 54°52'N. 8°22'E. Germany
2021399	4.7.59	16.6.60	Blackpool (Lancashire) 130m. SSW.
2021186	9.7.59	3.1.60	Sylt, Germany

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221767	9.7.59	24.1.60	Grünenthal: 54°08'N. 9°20'E. (Schleswig-Holstein) Germany
221788	9.7.59	2.7.60	Monster: 52°01'N. 4°10'E. (Zuid-Holland) Netherlands
221268	11.7.59	(12.10.60)	Williamsport: 50°32'N. 56°16'W. Newfoundland
221269	11.7.59	18.6.60	Budleigh Salterton (Devon) 350m. SSW.
228624	22.7.59	3.7.60	Terschelling, Netherlands
228817	22.7.59	(5.1.60)	near Rommani: 33°30'N. 6°45'W. Morocco

*Ringed as adult; the remainder were ringed as pulli

Common Tern (*Sterna hirundo*) (36; 100 miles; 3 $\frac{1}{2}$ years)

27003	pull.	5.7.59	Whiteness Head: 57°36'N. 4°00'W. (Nairn) JL
	×	7.6.60	Lumley: 8°30'N. 13°17'W. Sierra Leone
29586	pull.	17.7.60	Farne Islands: 55°37'N. 1°37'W. (Northumberland)
	+	10.11.60	Kayar: 14°53'N. 17°09'W. Sénégal
29694	pull.	10.8.59	Coquet Island: 55°20'N. 1°32'W. (Northumberland) JCC
	×	19.2.60	off Dakar: 14°38'N. 17°27'W. Sénégal
29066	pull.	20.7.60	Coquet Island JCC
	×	(4.9.60)	Great Yarmouth (Norfolk) 225m. SE.
29093	pull.	24.6.59	Lough Beg: 54°47'N. 6°30'W. (Londonderry) TE
	()	30.3.60	Tema: 5°41'N. 0°00' Ghana
29400	pull.	2.7.60	Seolt Head: 52°59'N. 0°45'E. (Norfolk) EAGD
	()	(27.10.60)	Cartaya: 37°16'N. 7°09'W. (Huelva) Spain
29457	pull.	7.6.59	Stoke: 51°37'N. 0°38'E. (Kent) F&M
	+	0.4.60	M'Bouri: 14°22'N. 16°54'W. Sénégal
29470	pull.	21.6.59	Stoke F&M
	×	1.4.60	Port Gentil: 0°40'S. 8°50'E. Gabon
29280	pull.	21.7.57	Rye Harbour: 50°56'N. 0°46'E. (Sussex) DBO
	×	(19.8.60)	Cayeux-sur-Mer: 50°11'N. 1°30'E. (Somme) France

Arctic Tern (*Sterna macrura*) (37; 100 miles; 2 $\frac{10}{12}$ years)

29549	pull.	16.7.58	Farne Islands: 55°37'N. 1°37'W. (Northumberland)
	v	c. 1.1.60	near Port Grosvenor: 31°20'S. 29°58'E. (Cape Province) South Africa
29707	pull.	6.7.60	Farne Islands
	×	(14.9.60)	Guetaria: 43°18'N. 2°11'W. (Guipúzcoa) Spain
2972	pull.	6.7.60	Farne Islands
	×	18.9.60	Challans: 46°51'N. 1°52'W. (Vendée) France
29372	pull.	8.7.60	Farne Islands
	×	(7.11.60)	Walvis Bay: 22°59'S. 14°31'E. South-West Africa
2935	pull.	10.7.60	Farne Islands
	×	(24.12.60)	Richards Bay: 28°48'S. 32°05'E. (Zululand) South Africa
298X	pull.	9.7.60	(Anglesey) RPC
	×	10.9.60	Vigo Bay: 42°15'N. 8°44'W. (Pontevedra) Spain
297X	pull.	17.7.60	(Anglesey) RPC
	×	(7.9.60)	Guéthary: 43°25'N. 1°36'W. (Basses-Pyrénées) France

Roseate Tern (*Sterna dougallii*) (4; 5 miles; 1 $\frac{1}{2}$ years)

2963	pull.	12.7.59	(Anglesey) RPC
	+	17.8.60	near Keta: 5°55'N. 1°01'E. Ghana

Sandwich Tern (*Sterna sandvicensis*) (58; 3 $\frac{11}{12}$ years)

2004967	pull. ×	6.7.57 14.8.60	Morich More: 57°50'N. 3°58'W. (Ross) TB Valle di Gorino: 44°50'N. 12°20'E. (Ferrara) Italy
296927	pull. ×	30.6.58 14.1.60	Farne Islands: 55°37'N. 1°37'W. (Northumberland) East London: 33°00'S. 25°54'E. (Cape Province) South Africa

An additional 40 British-ringed Sandwich Terns were recovered abroad, shown in Table E.

TABLE E—COUNTRIES AND MONTHS OF RECOVERIES OF SANDWICH TERNS
(*Sterna sandvicensis*)

Country of recovery	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
France (2)	1	1	—	—	—	—	—	—	—	—	—	—
Spain (4) and Portugal (2)	—	1	2	2	—	—	—	1	—	—	—	—
Mauritania (1) and S��n��gal (11)	1	1	—	—	1	2	1	3	2	(1)	—	—
Sierra Leone (6) and Liberia (3)	—	—	—	—	1	4	1	1	1	(1)	—	—
Ivory Coast (2), Ghana (4) and Dahomey (2)	1	—	(1)	—	1	2	1	2	—	—	—	—
Angola (3)	—	—	(1)	1	—	—	—	1	—	—	—	—

See footnote to Table A

Razorbill (*Alca torda*) (21; 150 miles; 2 $\frac{10}{12}$ years)

Birds ringed on Fair Isle, 59°32'N. 1°37'W. (Shetland), were recovered as follows:

Ringed		Recovered	
AT64022*	21.5.59	15.1.60	off Kristiansand: 58°08'N. 8°01'E. (Vest-Agder) Norway
AT64236	8.7.59	29.10.60	Kolding Fjord: c. 55°30'N. 9°35'E. (Jutland) Denmark
AT67092	7.7.60	(20.10.60)	Holmengr�� Fyr: 60°51'N. 4°39'E. (Hordaland) Norway
AT67172	7.7.60	9.10.60	Batalden: 61°39'N. 4°48'E. (Sogn-og-Fjordane) Norway

*Ringed as adult; the remainder were ringed as pulli

Birds ringed on Skokholm, 51°42'N. 5°16'W. (Pembroke), were recovered as follows:

Ringed		Recovered	
3055111*	10.7.58	4.1.60	Audierne: 48°01'N. 4°33'W. (Finist��re) France
3064730	16.6.59	(18.1.60)	San Sebastian: 43°19'N. 1°59'W. (Guip��zcoa) Spain
3064817	20.6.59	7.2.60	Villagarcia: 42°35'N. 8°45'W. (Pontevedra) Spain
3064836	21.6.59	25.11.60	Le Pyla: 44°37'N. 1°13'W. (Gironde) France

*Ringed as adult; the remainder were ringed as pulli

3076301	pull. ×	13.7.59 31.10.59	Calf of Man: 54°03'N. 4°49'W. CMRS Coxysde: 51°09'N. 2°37'W. (West Flanders) Belgium
AT15045	pull. ×	17.6.57 15.4.60	Lundy: 51°12'N. 4°40'W. (Devon) Granville: 48°50'N. 1°35'W. (Manche) France
AT15050	pull. +	17.6.57 8.4.60	Lundy Buddon Ness (Angus) 370m. NNE.
AT61501	pull. ×	22.6.58 0.1.60	Great Inisvoul: 49°58'N. 6°19'W. Scilly BE Vannes: 47°40'N. 2°44'W. (Morbihan) France

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Guillemot (*Uria aalge*) (15; 150 miles; 1½ years)

64267	pull. ()	8.7.59 15.2.60	Fair Isle: 59°32'N. 1°37'W. (Shetland) Nes: 63°48'N. 9°39'E. (Sör-Trøndelag) Norway
67134	pull. +	7.7.60 17.10.60	Fair Isle Karmøy: c. 59°15'N. 5°05'E. (Rogaland) Norway
61896	ad. ()	29.6.58 14.3.60	Sula Sgeir: 59°06'N. 6°10'W. Outer Hebrides TBB Cruden Bay (Aberdeen) 200m. ESE.
37858	pull. +	4.7.60 5.10.60	Farne Islands: 55°37'N. 1°37'W. (Northumberland) Kvitsøy: 59°04'N. 5°22'E. (Rogaland) Norway
37801	pull. +	6.7.60 12.11.60	Farne Islands Oslofjord: c. 59°00'N. 10°30'E. Norway
37846	pull. ()	14.7.60 4.12.60	Farne Islands Oslofjord, Norway
37850	pull. +	14.7.60 14.10.60	Farne Islands Eigerøy: 58°27'N. 5°50'E. (Rogaland) Norway
6103	pull. ×	19.6.59 27.8.60	Calf of Man: 54°03'N. 4°49'W. CMRS Winterton (Norfolk) 280m. ESE.
6128	pull. ×	24.6.59 18.2.60	Calf of Man CMRS Noordwijk: 52°15'N. 4°25'E. (Zuid-Holland) Netherlands
4689	pull. ()	19.6.59 2.7.60	Skomer: 51°44'N. 5°19'W. (Pembroke) SBO Erquy: 48°39'N. 2°30'W. (Côtes-du-Nord) France
9542	ad. ()	31.6.60 23.8.60	Scilly Rock: 49°58'N. 6°23'W. Scilly BE Fort-Bloqué: 47°43'N. 3°27'W. (Morbihan) France

Puffin (*Fratercula arctica*) (16; 100 miles; 8½ years)

birds ringed on the Farne Islands, 55°37'N. 1°37'W. (Northumberland), were recovered as follows:

Ringed		Recovered	
9683*	13.7.52	16.10.60	Marsteinen Fyr: 60°08'N. 5°02'E. (Hordaland) Norway
51397	7.7.59	3.4.60	Barmston (York) 120m. SSE.
1840*	9.7.59	3.1.60	Boknfjorden: c. 59°10'N. 5°30'E. (Rogaland) Norway
58391	21.7.60	18.9.60	Mökster: 60°01'N. 5°05'E. (Hordaland) Norway
58399	21.7.60	5.10.60	Haugesund: 59°27'N. 5°08'E. (Rogaland) Norway

*Ringed as adult; the remainder were ringed as pulli

Woodpigeon (*Columba palumbus*) (47; 70 miles; 10½ years)

706	pull. +	16.8.59 mid 1.60	Friskney: 53°04'N. 0°11'E. (Lincoln) CTB Gourin: 48°08'N. 3°37'W. (Morbihan) France
465	f.g. +	13.4.60 22.9.60	Great Saltee: 52°07'N. 6°35'W. (Wexford) Milton (Pembroke) 80m. ESE.

Turtle Dove (*Streptopelia turtur*) (5; 5 miles; 1½ years)

708	f.g. [?]	2.6.60 (19.11.60)	Bardsey: 52°46'N. 4°48'W. (Caernarvon) near Bayonne: 43°30'N. 1°28'W. (Basses-Pyrénées) France
44	ad. ×	25.6.58 c. 12.5.60	Abberton: 51°50'N. 0°53'E. (Essex) Marmolejo: 38°03'N. 4°10'W. (Jaén) Spain
84	f.g. +	17.9.60 10.10.60	near Wendover: 51°47'N. 0°46'W. (Buckingham) EJB Anglet: 43°29'N. 1°30'W. (Basses-Pyrénées) France
21	pull. +	21.8.60 22.10.60	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex) Sanlúcar: 36°46'N. 6°21'W. (Cádiz) Spain

Cuckoo (*Cuculus canorus*) (8; 15 miles; $5\frac{1}{12}$ years)

258901	juv.	30.7.58	Isle of May: $56^{\circ}11'N$. $2^{\circ}33'W$. (Fife)
	X	(13.6.60)	Cluanie, Glenmoriston (Inverness) 115m. NW.
251435	juv.	6.8.60	Spurn Point: $53^{\circ}35'N$. $0^{\circ}06'E$. (York)
	X	19.8.60	Anna Paulowna: $52^{\circ}52'N$. $4^{\circ}50'E$. (Noord-Holland) Netherlands
2702841	pull.	7.7.60	Totley: $53^{\circ}19'N$. $1^{\circ}33'W$. Sheffield (York) SNHS
	X	2.8.60	Wyverstone, Stowmarket (Suffolk) 130m. SE.
2013533	pull.	26.7.60	Capel St. Andrew: $52^{\circ}05'N$. $1^{\circ}29'E$. (Suffolk) PAB
	X	10.10.60	Amiens: $49^{\circ}54'N$. $2^{\circ}18'E$. (Somme) France

Little Owl (*Athene noctua*) (8; 10 miles; $3\frac{3}{12}$ years)

3002423	f.g.	14.12.58	Little Crosby: $53^{\circ}29'N$. $3^{\circ}02'W$. (Lancashire) NH
	X	26.4.60	East Witton, Leyburn (York) 70m. NE.

Short-eared Owl (*Asio flammeus*) (2; 5 miles; $4\frac{2}{12}$ years)

AF3936	pull.	8.5.56	Barr: $55^{\circ}13'N$. $4^{\circ}43'W$. (Ayr) JHO
	X	24.7.60	South Elkington, Louth (Lincoln) 225m. SE.

Nightjar (*Caprimulgus europaeus*) (1; $\frac{1}{12}$ year)

287405	1stW. ♂	13.9.60	Portland Bill: $50^{\circ}31'N$. $2^{\circ}27'W$. (Dorset)
	X	14.10.60	near Châteaubriant: $47^{\circ}41'N$. $1^{\circ}10'W$. (Loire-Atlantique) France

Swift (*Apus apus*) (78; 50 miles; $5\frac{10}{12}$ years)

J40022	ad.	28.6.59	Ilkley: $53^{\circ}56'N$. $1^{\circ}49'W$. (York) WNS
	X	21.5.60	at sea, 200m. WSW. of Land's End: $49^{\circ}33'N$. $10^{\circ}00'W$.
C30294	pull.	12.7.56	Oxford: $51^{\circ}45'N$. $1^{\circ}16'W$. EGI
	X	18.5.60	Purley (Surrey) 55m. ESE.
C98387	ad.	13.7.57	Beddington: $51^{\circ}23'N$. $0^{\circ}08'W$. (Surrey) LNHS
	+	6.4.60	near Kolé: $3^{\circ}41'S$. $22^{\circ}29'E$. (Kasai) Congo
K24824	ad.	28.6.59	Beddington LNHS
	X	8.8.60	Rasueros: $41^{\circ}02'N$. $5^{\circ}04'W$. (Avila) Spain

C98387 is the first British-ringed Swift to be recovered in Africa.

Swallow (*Hirundo rustica*) (77; $3\frac{11}{12}$ years)

AA5207—	pull.	21.6.60	near Earby: $53^{\circ}55'N$. $2^{\circ}08'W$. (York) W&M
	+	8.10.60	near Orlu: $5^{\circ}50'N$. $7^{\circ}05'E$. (Owerri) Nigeria
AA98617	juv.	23.9.60	Fairburn: $53^{\circ}45'N$. $1^{\circ}18'W$. Castleford (York) CW
	()	4.11.60	Bir Enzaran: $23^{\circ}56'N$. $14^{\circ}33'W$. Spanish West Africa
AA98109	1stW.	24.9.60	Fairburn CW
	X	31.12.60	near Ladysmith: $28^{\circ}34'S$. $29^{\circ}47'E$. (Natal) South Africa
J37259	pull.	21.7.59	Mickletown: $53^{\circ}44'N$. $1^{\circ}25'W$. Castleford (York) AF
	X	c. 19.10.60	Cérizay: $46^{\circ}49'N$. $0^{\circ}40'W$. (Deux-Sèvres) France
AA47308	ad.	5.6.60	Ackworth: $53^{\circ}39'N$. $1^{\circ}19'W$. Pontefract (York) AS
	X	19.10.60	near Bordeaux: $44^{\circ}50'N$. $0^{\circ}34'W$. (Gironde) France
J22734	pull.	11.6.59	near Whaley Bridge: $53^{\circ}18'N$. $1^{\circ}59'W$. (Derby) AAKW
	X	5.5.60	near Bethlehem: $28^{\circ}15'S$. $28^{\circ}19'E$. (Orange Free State) South Africa
AA58088	juv.	10.9.60	near Sleaford: $52^{\circ}57'N$. $0^{\circ}23'W$. (Lincoln) LC
	X	28.10.60	Zaouiet Reggan: $26^{\circ}42'N$. $0^{\circ}13'E$. Algeria

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86949	pull. v	12.7.59 5.3.60	Twycross: 52°39'N. 1°30'W. (Leicester) HL Shabunda: 2°42'S. 27°20'E. (Kivu) Congo
183	juv. x	4.9.59 5.1.60	Nuncaton: 52°32'N. 1°28'W. (Warwick) HL Vryburg: 26°57'S. 24°44'E. (Bechuanaland) South Africa
10475	pull. v	5.7.59 9.2.60	Skomer: 51°44'N. 5°19'W. (Pembroke) CKM Glen Siding: 28°57'S. 26°15'E. (Orange Free State) South Africa
709	juv. +	4.10.60 17.10.60	Elm Park: 51°33'N. 0°12'E. Romford (Essex) RRS Sanlúcar: 36°46'N. 6°21'W. (Cádiz) Spain
1906	pull. v	21.8.59 4.5.60	Northfleet: 51°27'N. 0°24'E. (Kent) MB Hassi bel Kiouta: 31°38'N. 6°07'E. Algeria

Six Swallows were recovered within Britain at distances of more than 80 miles.

Sand Martin (*Riparia riparia*) (117; 100 miles; 4 $\frac{11}{12}$ years)

2430	ad. x	20.7.60 26.8.60	near Seahouses: 55°35'N. 1°39'W. (Northumberland) MHBO Barton-on-Humber (Lincoln) 135m. SSE.
53688	juv. v	9.7.60 13.8.60	Addingham: 53°56'N. 1°49'W., Ilkley (York) CGB Sutton Bridge (Lincoln) 115m. SE.
90691	juv. v	7.9.60 19.9.60	Fairburn: 53°46'N. 1°18'W., Castleford (York) CW Sandwich (Kent) 200m. SE.
073	ad. v	20.6.59 3.7.60	Bleasby: 53°03'N. 0°57'W. (Nottingham) JASB Godstone, Redhill (Surrey) 130m. SSE.
616	ad. x	19.7.59 (13.7.60)	Sheffield: 52°02'N. 0°20'W. (Bedford) EHW Le Verdon: 45°33'N. 1°04'W. (Gironde) France
75	juv. v	30.8.59 21.6.60	Elm Park: 51°33'N. 0°12'E., Romford (Essex) RRS Hoveringham (Nottingham) 110m. NNW.
400	juv. v	3.8.59 31.8.60	Sandwich: 51°17'N. 1°20'E. (Kent) SBRS Fairburn, Castleford (York) 200m. NW.
172	juv. v	16.7.59 19.6.60	Littlebourne: 51°16'N. 1°11'E. (Kent) SBRS Cassington (Oxford) 110m. WNW.

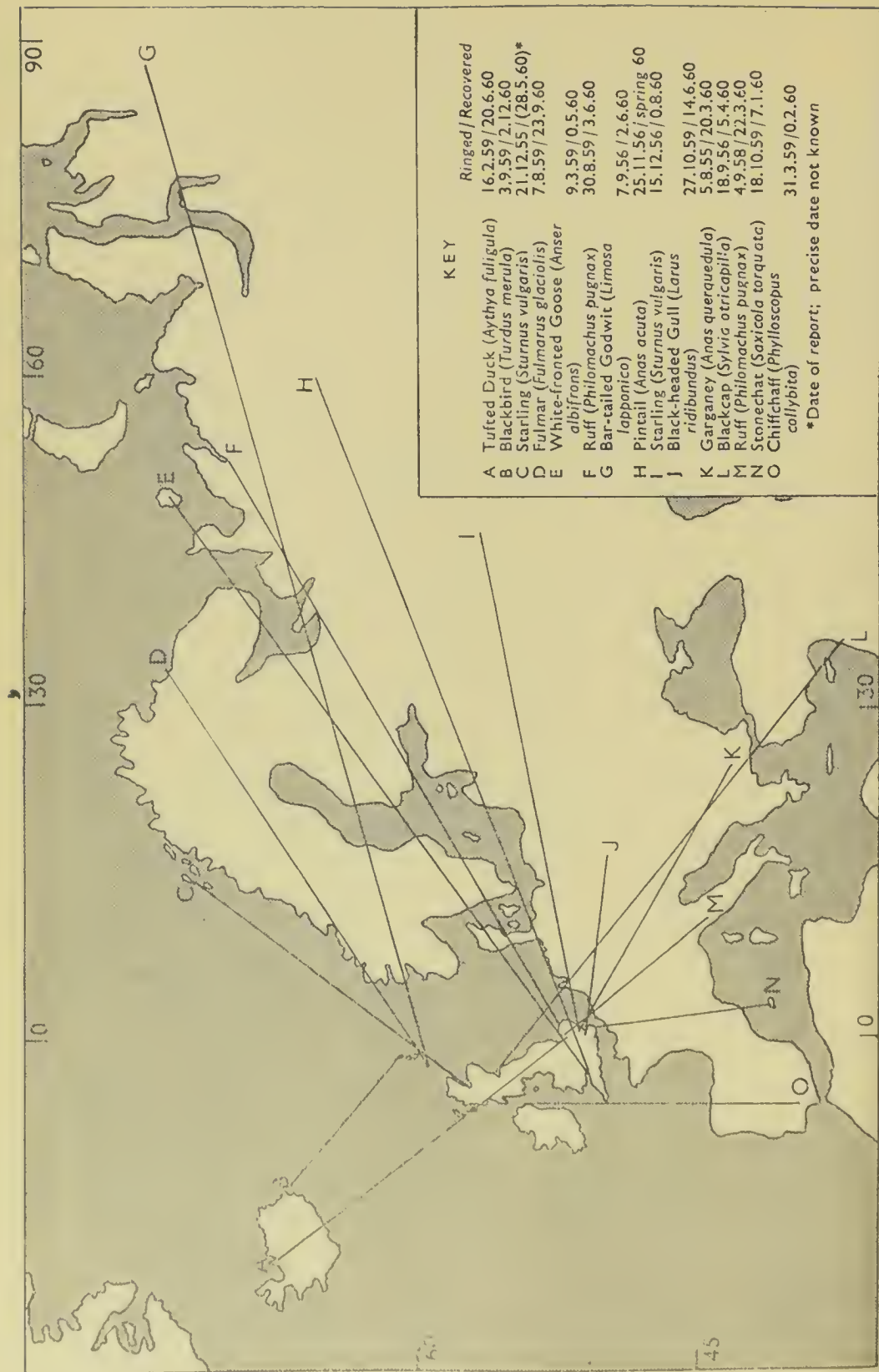
Jackdaw (*Corvus monedula*) (29; 20 miles; 9 $\frac{2}{12}$ years)

164	f.g. [?]	3.4.60 15.4.60	Spurn Point: 53°35'N. 0°06'E. (York) De Koog: 53°06'N. 4°46'E. Texel, Netherlands
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Great Tit (*Parus major*) (158; 30 miles; 6 $\frac{10}{12}$ years)

145	f.g. v	22.10.59 9.4.60	Esher: 51°23'N. 0°22'W. (Surrey) GcB Mellun: 53°44'N. 8°10'E. East Frisian Islands, Germany
284	ad. ♀ x A	4.4.58 (21.2.60)	Kingsgate: 51°22'N. 1°27'E. (Kent) DCHW Chartres: 48°27'N. 1°30'E. (Eure-et-Loir) France
180	f.g. x	2.2.58 (31.5.60)	Eythorne: 51°12'N. 1°17'E. (Kent) SBRS Altenessen: 51°29'N. 7°00'E. (Nordrhein-Westfalen) Germany
91	f.g. x	12.3.60 (7.7.60)	Shoreham-by-Sea: 50°50'N. 0°16'W. (Sussex) JS Bremerhaven: 53°33'N. 8°35'E. (Niedersachsen) Germany
28	1st W. x	20.2.60 (14.3.60)	Brighstone: 50°38'N. 1°24'W. Isle of Wight JHS Wassenaar: 52°09'N. 4°23'E. (Zuid-Holland) Netherlands

145 and E39284 are, respectively, the most northerly and the most southerly foreign recoveries of British-ringed Great Tits.



KEY

	Ringed / Recovered
A Tufted Duck (<i>Aythya fuligula</i>)	16.2.59 / 20.6.60
B Blackbird (<i>Turdus merula</i>)	3.9.59 / 2.12.60
C Starling (<i>Sturnus vulgaris</i>)	21.12.55 / (28.5.60)*
D Fulmar (<i>Fulmarus glacialis</i>)	7.8.59 / 23.9.60
E White-fronted Goose (<i>Anser albifrons</i>)	9.3.59 / 0.5.60
F Ruff (<i>Philomachus pugnax</i>)	30.8.59 / 3.6.60
G Bar-tailed Godwit (<i>Limosa lapponica</i>)	7.9.56 / 2.6.60
H Pintail (<i>Anas acuta</i>)	25.11.56 / spring 60
I Starling (<i>Sturnus vulgaris</i>)	15.12.56 / 0.8.60
J Black-headed Gull (<i>Larus ridibundus</i>)	27.10.59 / 14.6.60
K Garganey (<i>Anas querquedula</i>)	5.8.55 / 20.3.60
L Blackcap (<i>Sylvia atricapilla</i>)	18.9.56 / 5.4.60
M Ruff (<i>Philomachus pugnax</i>)	4.9.58 / 22.3.60
N Stonechat (<i>Saxicola torquata</i>)	18.10.59 / 7.1.60
O Chiffchaff (<i>Phylloscopus collybita</i>)	31.3.59 / 0.2.60

*Date of report; precise date not known



(Left) Recoveries in Africa in 1960 of Swallows (*Hirundo rustica*) (●) and one Swift (*Apus apus*) (○) ringed in Britain; the figure by each dot shows the month of recovery. (Right) Recoveries abroad in winter 1959-60 of Song Thrushes (*Turdus philomelos*) ringed in Britain

BRITISH BIRDS

Blue Tit (*Parus caeruleus*) (325; 30 miles; $7\frac{4}{12}$ years)

K59822	ad.	13.5.59	Kington: $52^{\circ}12'N$. $3^{\circ}02'W$. (Hereford) RB
	v	13.2.60	near Liverpool (Lancashire) 80m. N.
F24315	f.g.	8.4.58	Stewkley: $51^{\circ}56'N$. $0^{\circ}46'W$. (Buckingham) D&Q
	x	14.11.60	Haywards Heath (Sussex) 68m. SSE.
65263	f.g.	9.1.60	Cliffe: $51^{\circ}28'N$. $0^{\circ}30'E$. (Kent) NKRK
	x	24.6.60	Elinsted, Ashford (Kent) 30m. SE.
E50677	ad.	21.12.58	Hermitage: $51^{\circ}27'N$. $1^{\circ}16'W$. Newbury (Berkshire) NDP
	v	22.2.60	Breaston (Derby) 95m. N.
E85765	ad.	14.4.58	near Bearsted: $51^{\circ}17'N$. $0^{\circ}35'E$. (Kent) EGP
	x	9.2.60	near Bedford c. 70m. NW.
K94316	f.g.	26.2.59	Hailsham: $50^{\circ}52'N$. $0^{\circ}16'E$. (Sussex) PSR
	x	22.8.60	Ockley (Surrey) 33m. NW.
K86937	f.g.	27.11.58	Blandford: $50^{\circ}52'N$. $2^{\circ}08'W$. (Dorset) BS
	x	13.3.60	Honiton (Devon) 42m. W.
E71837	ad.	28.12.57	Shoreham-by-Sea: $50^{\circ}50'N$. $0^{\circ}16'W$. (Sussex) JS
	x	10.2.60	Sutton Valence (Kent) 45m. ENE.

Coal Tit (*Parus ater*) (9; 12 miles; $1\frac{3}{12}$ years)

J39768	ad.	24.4.60	Bradwell-on-Sea: $51^{\circ}44'N$. $0^{\circ}54'E$. (Essex)
	x	4.5.60	Noord-Hinder Lightship: $51^{\circ}39'N$. $2^{\circ}34'E$. North Sea

Wren (*Troglodytes troglodytes*) (17; 5 miles; $1\frac{6}{12}$ years)

72357	1st W.	3.10.59	Dungeness: $50^{\circ}55'N$. $0^{\circ}59'E$. (Kent)
	+	0.1.60	Port St. Louis: $43^{\circ}23'N$. $4^{\circ}49'E$. (Bouches-du-Rhône) France
74041	f.g.	23.10.59	Shoreham-by-Sea: $50^{\circ}50'N$. $0^{\circ}16'W$. (Sussex) JS
	x	31.1.60	Great Bookham (Surrey) 30m. N.

72357 is only the second foreign recovery of a British-ringed Wren.

Mistle Thrush (*Turdus viscivorus*) (27; 10 miles; $4\frac{3}{12}$ years)

S60612	f.g.	18.2.59	Spurn Point: $53^{\circ}35'N$. $0^{\circ}06'E$. (York)
	x	2.3.60	Headingley, Leeds (York) 70m. W.

Fieldfare (*Turdus pilaris*) (2; 5 miles; $1\frac{1}{12}$ year)

R63312	ad.	14.2.59	Fulbourn Fen: $52^{\circ}12'N$. $0^{\circ}15'E$. (Cambridge) PRE
	+	15.1.60	Zumaya: $43^{\circ}19'N$. $2^{\circ}15'W$. Deva (Guipúzcoa) Spain

Song Thrush (*Turdus philomelos*) (295; $5\frac{9}{12}$ years)

R66735	f.g.	9.9.59	Skinburness: $54^{\circ}53'N$. $3^{\circ}22'W$. (Cumberland) RS
	+	8.1.60	Coristanco: $43^{\circ}12'N$. $8^{\circ}44'W$. (Coruña) Spain
V89784	f.g.	4.10.59	Spurn Point: $53^{\circ}35'N$. $0^{\circ}06'E$. (York)
	x	(20.11.60)	Øksbøl: $55^{\circ}38'N$. $8^{\circ}17'E$. (Jutland) Denmark
V91729	pull.	3.7.58	Govertton: $53^{\circ}03'N$. $0^{\circ}57'W$. (Nottingham) JMM
	/?/	7.2.60	Aveiro: $40^{\circ}38'N$. $8^{\circ}40'W$. (Beira Litoral) Portugal
R36918	juv.	7.8.59	Watnall: $53^{\circ}01'N$. $1^{\circ}15'W$. (Nottingham) JMM
	+	3.3.60	Labrède: $44^{\circ}42'N$. $0^{\circ}31'W$. (Gironde) France
S25549	f.g.	17.12.58	Cley: $52^{\circ}58'N$. $1^{\circ}03'E$. (Norfolk)
	+	22.1.60	Braga: $41^{\circ}32'N$. $8^{\circ}26'W$. (Minho) Portugal

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984X	f.g. +	17.10.59 (8.6.60)	Cley Paterna de Rivera: 36°32'N. 5°52'W. (Cádiz) Spain
6137	juv. +	15.8.59 4.2.60	Colsterworth: 52°48'N. 0°37'W. (Lincoln) LC Villaviciosa: 43°29'N. 5°26'W. (Oviedo) Spain
0199	f.g. +	31.12.59 16.1.60	Henley-in-Arden: 52°17'N. 1°46'W. (Warwick) KHT near Castrillón: 43°33'N. 5°58'W. (Oviedo) Spain
6465	ad. +	2.7.59 12.1.60	Sibton: 52°17'N. 1°29'E. (Suffolk) DJP Laujuzan: 43°48'N. 0°07'W. (Gers) France
5533	f.g. ×	25.7.59 23.2.60	Hoo: 51°26'N. 0°34'E. (Kent) F&M Mont St. Michel: 48°38'N. 1°30'W. (Manche) France
1882	juv. +	31.7.57 1.12.57	Beddington: 51°23'N. 0°08'W. (Surrey) LNHS St. Gildas-des-Bois: 47°32'N. 2°02'W. (Loire-Atlantique) France
8853	f.g. ()	12.4.59 15.1.60	Sittingbourne: 51°20'N. 0°39'E. (Kent) WFAB Angoulême: 45°40'N. 0°10'E. (Charente) France
2652	f.g. ×	10.1.59 3.7.60	East Malling: 51°18'N. 0°26'E. (Kent) JFN Gistel: 51°09'N. 3°58'E. (West Flanders) Belgium
369	1st W. ×	16.10.56 0.1.60	Dungeness: 50°55'N. 0°59'E. (Kent) Tancarville: 49°29'N. 0°28'E. (Seine-Maritime) France
128	1st W. +	5.10.59 18.2.60	Dungeness Huelva: 37°15'N. 6°56'W. Spain
441	f.g. ×	14.10.59 14.10.60	Dungeness Lierneux: 50°17'N. 5°47'E. (Liège) Belgium
58X	ad. +	25.3.60 (31.10.60)	Dungeness Montcaret: 44°52'N. 0°04'E. (Dordogne) France
297	juv. +	25.5.60 6.11.60	Shoreham-by-Sea: 50°50'N. 0°16'W. (Sussex) IS St. Pierre Église: 49°40'N. 1°25'W. (Manche) France

any more Song Thrushes than usual were recovered abroad in the winter of 1959-60 (see also "Report on bird-ringing for 1959", *Brit. Birds*, 53: 490-491).

Redwing (*Turdus musicus*) (12; 50 miles; 5 $\frac{1}{12}$ years)

212	1st W. ×	9.10.54 15.4.60	Fair Isle: 59°32'N. 1°37'W. (Shetland) Meleski: 58°26'N. 26°05'E. Estonian S.S.R.
134	1st W. +	9.10.59 0.2.60	Fair Isle Margueron: 44°45'N. 0°16'E. (Gironde) France
167	1st W. ()	23.10.58 26.1.60	Bardsey: 52°46'N. 4°48'W. (Caernarvon) Atalaia: 40°40'N. 7°02'W. (Beira Alta) Portugal
44	f.g. +	7.10.59 c. 15.2.60	Bardsey Monte Longo: 38°50'N. 7°10'W. (Alto Alentejo) Portugal
66	f.g. +	27.12.58 26.1.60	Rugeley: 52°46'N. 1°55'W. (Stafford) C&PM Cittanova: 38°46'N. 16°05'E. (Reggio di Calabria) Italy
01	f.g. +	25.1.58 21.1.60	Colchester: 51°53'N. 0°53'E. (Essex) NS Hlinojos: 37°17'N. 6°24'W. (Huelva) Spain
75	ad. × A	12.12.59 4.11.60	Havering: 51°37'N. 0°11'E. (Essex) JEF Möklinta: 60°05'N. 16°35'E. (Västmanland) Sweden
32	1st W. ×	15.11.58 11.8.60	Lundy: 51°12'N. 4°40'W. (Devon) Ladva: 61°22'N. 34°39'E. (Karelia) U.S.S.R.
176	f.g. +	5.11.58 (20.2.60)	Guildford: 51°14'N. 0°35'W. (Surrey) NJW Laurito: 40°09'N. 15°24'E. (Salerno) Italy

Ring Ouzel (*Turdus torquatus*) (2; 5 miles; $\frac{5}{12}$ year)

724916	f.g. ♀	22.5.60	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+	20.10.60	Ambax: 43°25'N. 0°54'E. (Haute-Garonne) France

Blackbird (*Turdus merula*) (786; 9 $\frac{3}{12}$ years)TABLE F—COUNTRIES AND MONTHS OF RECOVERIES OF BLACKBIRDS (*Turdus merula*)

Country of recovery	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Norway (12)	3	—	—	—	—	1	3	3	—	2	—	—
Sweden (10)	1	—	—	—	—	1	2	3	—	1	1	1
Denmark (6)	—	—	—	1	—	—	2	(1)	—	1	—	1
Germany (26)	1	—	1	1	1	3	4	4	5	4	1	1
Netherlands (7) and Belgium (1)	—	—	1	—	—	2	(1)	1	1	2	—	—
France (7)	1	—	2	3	1	—	—	—	—	—	—	—
Ireland (15)	—	—	1	8	4	2	—	—	—	—	—	—

See footnote to Table A

Three birds ringed in Ireland in winter were recovered in Great Britain, two of them in April and one in August. Thirty-one others showed movements of over 50 miles, but only twelve of these could confidently be regarded as of British origin. Published in full are all foreign recoveries of British-bred birds, and all recoveries north of 67°N., east of 12°E. (excluding Sweden) and south of 46°N.

S78937	juv.	3.9.59	Unst: 60°45'N. 0°55'W. (Shetland) CJRT
	v	2.12.60	Eidar: 65°23'N. 14°21'W. (Sudur Múla Sysla) Iceland
R35741	f.g. ♀	5.4.60	Isle of May: 56°11'N. 2°33'W. (Fife)
	v	27.7.60	Aikkinen: 60°43'N. 22°02'E. (Turku ja Pori) Finland
R56645	ad. ♀	10.10.59	near Beal: 55°39'N. 1°54'W. (Northumberland) ND&N
	+	27.2.60	St. Vivien: 45°26'N. 1°02'W. (Gironde) France
S28835	ad. ♂	1.11.59	Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
	×	15.5.60	Röst: 67°33'N. 12°10'E., Lofoten Islands, Norway
R76305	1st W. ♂	1.10.59	Minsmere: 52°14'N. 1°37'E. (Suffolk) HEA
	×	(1.2.60)	near Braune: 44°50'N. 0°10'W. (Gironde) France
V78957	ad. ♂	10.10.59	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
	+	16.1.60	Puente Viesgo: 43°18'N. 3°58'W. (Santander) Spain
V63996	f.g. ♀	8.11.59	Hillingdon: 51°33'N. 0°27'W. (Middlesex) HAB
	×	15.8.60	Lautna: 58°44'N. 23°55'E. Estonian S.S.R.
R47060	1st W.	30.9.59	Dungeness: 50°55'N. 0°59'E. (Kent)
	+	10.1.60	near Carranque: 40°10'N. 3°55'W. (Toledo) Spain
S82648	juv.	23.5.59	Portland Bill: 50°31'N. 2°27'W. (Dorset)
	+	6.3.60	near St. Nazaire: 47°20'N. 2°12'W. (Loire-Atlantique) France

Wheatear (*Oenanthe oenanthe*) (6; 5 miles; 1 year)

600574	juv.	10.7.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	()	0.10.59	Villagarcia: 38°18'N. 6°05'W. (Badajóz) Spain
606382	1st W. ♂	4.9.59	Fair Isle
	×	(7.5.60)	Sigoulès: 44°45'N. 0°25'E. (Dordogne) France
613729	pull.	24.6.60	Fair Isle
	+	(27.9.60)	Noves: 40°03'N. 4°17'W. (Toledo) Spain
618228	juv.	7.8.60	Fair Isle
	+	2.10.60	Herrera: 37°22'N. 4°50'W. (Sevilla) Spain

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67120	juv.	26.8.59	Dungeness: 50°55'N. 0°59'E. (Kent)
×	×	28.8.60	Cap Ferret: 44°42'N. 1°16'W. (Gironde) France

Stonechat (*Saxicola torquata*) (8; 10 miles; 1 $\frac{3}{12}$ years)

5412	juv. ♀	11.8.59	Bardsey: 52°46'N. 4°48'W. (Caernarvon)
×	×	c. 5.12.60	near Lagor: 43°24'N. 0°39'W. (Basses-Pyrénées) France
6334	ad. ♀	23.9.60	Skokholm: 51°42'N. 5°16'W. (Pembroke)
/?/	/?/	8.11.60	Badolatosa: 37°19'N. 4°40'W. (Sevilla) Spain
67997	f.g. ♂	18.10.59	Dungeness: 50°55'N. 0°59'E. (Kent)
+	+	7.1.60	Felanitz: 39°28'N. 3°08'E. Majorca
130404	ad. ♂	15.9.60	Dungeness
×	×	20.11.60	Selles: 47°16'N. 1°33'E. (Loir-et-Cher) France
57754	f.g. ♀	22.8.59	near Christchurch: 50°43'N. 1°45'W. (Hampshire) FRC
+	+	7.2.60	Noisy-les-Bains: 35°47'N. 0°03'E. Mostaganem, Algeria
75261	f.g.	3.10.59	Portland: 50°31'N. 2°27'W. (Dorset)
()	c.	16.1.60	Alcañiz: 41°03'N. 0°09'W. (Teruel) Spain

57754 is the first British-ringed Stonechat to be recovered in Africa.

Whinchat (*Saxicola rubetra*) (2; 5 miles; $\frac{9}{12}$ year)

9627	f.g.	22.8.59	East Tilbury: 51°28'N. 0°26'E. (Essex) H&W
×	×	1.6.60	Nysätra: 59°45'N. 17°08'E. (Uppsala) Sweden

This is the first British-ringed Whinchat to be recovered in Scandinavia.

Redstart (*Phoenicurus phoenicurus*) (10; 25 miles; 4 $\frac{4}{12}$ years)

4218	ad. ♀	7.5.59	Farne Islands: 55°37'N. 1°37'W. (Northumberland) MHBO
×	×	15.4.60	Ouarzazate: 30°57'N. 6°50'W. Morocco
A19315	pull.	10.6.60	near Sedbergh: 54°17'N. 2°25'W. (York) ACW
/?/	/?/	(21.11.60)	Andújar: 38°02'N. 4°03'W. (Jaén) Spain
6282	ad. ♂	5.5.60	Spurn Point: 53°35'N. 0°06'E. (York)
×	×	(30.8.60)	Aberfoyle (Perth) 250m. NW.
A13400	1stW. ♂	12.9.60	Spurn
()	()	(1.11.60)	Almedinilla: 37°27'N. 4°05'W. (Córdoba) Spain
4686	1stW. ♂	17.9.60	Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
/?/	/?/	(5.10.60)	Alfaro: 42°11'N. 1°45'W. (Logroño) Spain
78984	ad. ♂	1.5.56	Dungeness: 50°55'N. 0°59'E. (Kent)
×	×	23.9.60	Bornes: 41°27'N. 7°00'W. (Alto Douro) Portugal
3046	ad. ♀	19.9.59	Shoreham-by-Sea: 50°50'N. 0°16'W. (Sussex) JS
+	+	11.5.60	Neubörm: 54°25'N. 9°24'E. (Schleswig-Holstein) Germany
A21714	f.g. ♂	23.4.60	near Christchurch: 50°43'N. 1°45'W. (Hampshire) CHRS
×	×	(10.5.60)	Loch Meiklie: 57°20'N. 4°35'W. (Inverness) 465m. NNW.

Robin (*Erithacus rubecula*) (170; 65 miles; 4 $\frac{8}{12}$ years)

7249	f.g.	7.4.58	Fair Isle: 59°32'N. 1°37'W. (Shetland)
×	×	(24.3.60)	Papenburg: 53°05'N. 7°25'E. (Niedersachsen) Germany
045	1stS.	18.5.60	Fair Isle
v	v	30.5.60	Trischen: 54°05'N. 8°40'E. Heligoland Bight, Germany
6317	juv.	30.7.59	Avoch: 57°34'N. 4°10'W. (Ross) JL
×	×	25.1.60	Irvine (Ayr) 140m. S.
482905	f.g.	22.9.60	Carnforth: 54°08'N. 2°46'W. (Lancashire) JW
×	×	18.11.60	Roslin (Midlothian) 120m. N.

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K37387	f.g. ×	4.4.58 20.1.60	Spurn Point: 53°35'N. 0°06'E. (York) Golegã: 39°24'N. 8°29'W. (Ribatejo) Portugal
E65191	1stW. ×	16.8.59 c. 30.1.60	Cassington: 51°47'N. 1°20'W. (Oxford) RBS near Mareuil: 46°32'N. 1°13'W. (Vendée) France
AA96145	f.g. ()	1.10.60 16.10.60	Sandwich Bay: 51°17'N. 1°20'E. (Kent) SBRS Bay of Biscay: 44°57'N. 3°53'W.
J66554	f.g. +	8.10.59 30.1.60	Eastbourne: 51°00'N. 0°44'W. (Sussex) DDH Puebla del Rio: 37°16'N. 6°04'W. (Sevilla) Spain
H38548	f.g. +	26.10.60 2.12.60	Dungeness: 50°55'N. 0°59'E. (Kent) Chauchina: 37°12'N. 3°46'W. (Granada) Spain
F25806	f.g. ×	27.3.58 (22.1.60)	Dungeness Pluvigner: 47°47'N. 3°00'W. (Morbihan) France
33466	juv. ×	12.6.59 (9.3.60)	Holwell: 50°55'N. 1°56'W. (Dorset) RFH St. Ives (Huntingdon) 130m. NE.
AA70481	f.g. ×	4.9.60 22.9.60	near Christchurch: 50°43'N. 1°45'W. (Hampshire) CHRS Ranuhec: 47°42'N. 2°39'W., Elven (Morbihan) France
J75244	f.g. ×	3.10.59 (22.3.60)	Portland Bill: 50°31'N. 2°27'W. (Dorset) Martham, Ludham (Norfolk) 225m. NE.

British-ringed Robins were recovered abroad in unprecedented numbers in the winter of 1959-60 (see also the "Report on bird-ringing for 1959", *Brit. Birds*, 53: 494).

Grasshopper Warbler (*Locustella naevia*) (1; 18 days)

H11828	juv. ×	3.8.60 21.8.60	Dungeness: 50°55'N. 0°59'E. (Kent) Tarbes: 43°14'N. 0°05'E. (Hautes-Pyrénées) France
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This is the first British-ringed Grasshopper Warbler to be recovered abroad.

Reed Warbler (*Acrocephalus scirpaceus*) (9; 10 miles; 1 year)

62414	juv. ()	4.8.59 0.9.60	Attenborough: 52°54'N. 1°14'W. (Nottingham) JASB Lisbon: 38°44'N. 9°08'W. Portugal
J65912	ad. [?]	16.7.60 22.9.60	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC Abrantes: 39°28'N. 8°12'W. (Ribatejo) Portugal
AA60147	juv. +	6.8.60 22.9.60	Broxbourne: 51°45'N. 0°01'W. (Hertford) TWG Castelo de Paiva: 41°02'N. 8°16'W. (Douro Litoral) Portugal
AA54595	pull. +	1.8.60 12.10.60	Swindon: 51°34'N. 1°47'W. (Wiltshire) GLW Fuencarral: 40°30'N. 3°40'W. (Madrid) Spain
H14323	juv. +	23.7.60 18.9.60	East Tilbury: 51°28'N. 0°26'E. (Essex) H&W La Coruña: 43°22'N. 8°24'W. (Coruña) Spain
H31991	f.g. ×	27.8.60 (21.9.60)	Cliffe: 51°28'N. 0°30'E. (Kent) NKRG Carcavolos: 38°41'N. 9°20'W. (Estremadura) Portugal
H29365	juv. +	17.8.60 c. 12.9.60	Dungeness: 50°55'N. 0°59'E. (Kent) Curia: 40°25'N. 8°29'W. (Beira Litoral) Portugal

There are only four previous foreign recoveries of British-ringed Reed Warblers.

Sedge Warbler (*Acrocephalus schoenobaenus*) (3; 10 miles; 3½ years)

J65860	juv. ×	15.7.60 5.8.60	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC Kidlington (Oxford) 125m. WSW.
A60528	ad. ×	12.5.56 1.5.60	Lundy: 51°12'N. 4°40'W. (Devon) Audenge: 44°42'N. 1°01'W. (Gironde) France

Blackcap (*Sylvia atricapilla*) (5; 5 miles; 3 $\frac{7}{12}$ years)

570	f.g. ♀	19.10.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+	26.4.60	Elche: 38°16'N. 0°41'W. (Alicante) Spain
5205	f.g. ♀	18.9.56	Isle of May: 56°11'N. 2°33'W. (Fife)
	+	25.4.60	near Amyun: 34°19'N. 35°48'E. Lebanon
58592	f.g. ♀	1.10.60	Isle of May
	()	22.10.60	San Rafael: 40°36'N. 0°20'E. (Castellón) Spain
227	juv.	3.7.60	Havering: 51°37'N. 0°11'E. (Essex) JEF
	+	7.10.60	Doña Mencía: 37°33'N. 4°21'W. (Córdoba) Spain

6205 is the first British-ringed Blackcap to show a south-easterly trend.

Whitethroat (*Sylvia communis*) (9; 25 miles; 3 $\frac{2}{12}$ years)

8063	f.g.	25.7.58	Freshfield: 53°34'N. 3°05'W. (Lancashire) RPC
	+	20.9.60	Faro: 37°01'N. 7°56'W. (Algarve) Portugal
2423	1st W.	9.9.59	Great Saltee: 52°07'N. 6°35'W. (Wexford)
	v	3.5.60	Skokholm (Pembroke) 60m. ESE.
8328	juv.	26.8.57	Chelmsford: 51°44'N. 0°28'E. (Essex) P&B
	×	15.1.60	Plencia: 43°24'N. 2°56'W. (Vizcaya) Spain
81	f.g. ♀	12.5.58	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	×	0.5.60	Corsham (Wiltshire) 130m. E.
71	ad. ♀	25.5.59	Skokholm
	×	26.4.60	Gémozac: 45°35'N. 0°40'W. (Charente-Maritime) France

Lesser Whitethroat (*Sylvia curruca*) (3; 5 miles; 2 years)

65	f.g.	8.5.57	Spurn Point: 53°35'N. 0°06'E. (York)
	v	23.5.59	Cambridge 95m. S.
68	ad.	17.8.60	Havering: 51°37'N. 0°11'E. (Essex) JEF
	+	(17.10.60)	Capo di Ponte: 46°02'N. 10°21'E. (Brescia) Italy

Willow Warbler (*Phylloscopus trochilus*) (18; 20 miles; 3 years)

19	1st W.	30.8.60	Isle of May: 56°11'N. 2°33'W. (Fife)
	×	7.9.60	Rayleigh (Essex) 340m. SSE.
96	1st W.	19.9.59	Great Saltee: 52°07'N. 6°35'W. (Wexford)
	v	2.5.60	Skokholm (Pembroke) 60m. ESE.
90	f.g.	8.5.60	Great Saltee
	×	(6.8.60)	near Poyntzpass (Down) 155m. N.
40	f.g.	10.4.59	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC
	×	5.4.60	near Swansea (Glamorgan) 240m. WSW.
08	f.g.	4.5.57	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
	×	20.5.60	Burnt Yates, Ripley (York) 175m. NW.
22	juv.	13.8.57	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	×	(6.5.60)	Coleraine (Londonderry) 175m. NNW.
27	juv.	4.8.57	Dungeness: 50°55'N. 0°59'E. (Kent)
	×	27.4.60	Walton, Wakefield (York) 215m. NW.
13	f.g.	7.5.60	Dungeness
	+	2.10.60	Sanlúcar: 36°46'N. 6°21'W. (Cádiz) Spain
212	1st W.	5.9.60	Shoreham-by-Sea: 50°50'N. 0°16'W. (Sussex) JS
	+	12.9.60	near Algorta: 43°20'N. 3°00'W. (Vizcaya) Spain
634	ad.	13.8.60	Eastbourne: 50°46'N. 0°17'E. (Sussex) DDH
	×	2.10.60	near León: 42°35'N. 5°34'W. Spain

Chiffchaff (*Phylloscopus collybita*) (6; $1\frac{5}{12}$ years)

K54406	ad.	31.3.59	Copland: 54°40'N. 5°32'W. (Down)
	+	0.2.60	Guadalcanal: 38°06'N. 5°49'W. (Sevilla) Spain
124618	ad.	3.9.59	Copland
	×	13.9.60	Les Gatines-Rouges: 48°52'N. 1°30'E. (Eure-et-Loir) France
A187041	f.g.	13.9.60	Great Saltee: 52°07'N. 6°35'W. (Wexford)
	+	15.10.60	Sanlúcar: 36°46'N. 6°21'W. (Cádiz) Spain
52842	f.g.	18.9.59	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	12/	21.2.60	El Aiun: 27°09'N. 13°12'W. Spanish West Africa
86337	f.g. ♂	24.9.60	Skokholm
	+	29.10.60	near Tetuán: 35°34'N. 5°23'W. Morocco
E76625	f.g.	16.9.58	Portland Bill: 50°31'N. 2°27'W. (Dorset)
	+	c. 0.3.60	Sanlúcar, Spain

Goldcrest (*Regulus regulus*) (1; $\frac{6}{12}$ year)

J20900	f.g.	5.10.59	Spurn Point: 53°35'N. 0°06'E. (York)
	×	19.4.60	Rantum: 54°51'N. 8°18'E., Sylt, Germany

Spotted Flycatcher (*Muscicapa striata*) (6; 10 miles; $1\frac{1}{12}$ years)

89651	1stW.	27.8.60	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+	27.10.60	Valdagno: 45°39'N. 11°18'E. (Vicenza) Italy
86321	1stW.	20.9.60	Skokholm: 51°42'N. 5°16'W. (Pembroke)
	+	5.11.60	Sabiote: 38°05'N. 3°18'W. (Jaén) Spain

89651 is the first British-ringed Spotted Flycatcher to be recovered in Italy.

Pied Flycatcher (*Muscicapa hypoleuca*) (5; 15 miles; $1\frac{9}{12}$ years)

H32574	ad. ♂	23.9.60	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	+	c. 20.10.60	Zarauz: 43°17'N. 2°10'W. (Guipúzcoa) Spain
K46742	pull.	21.6.58	Capel Curig: 53°06'N. 3°54'W. (Caernarvon) RAFK
	+	13.4.60	Arévalo: 41°04'N. 4°44'W. (Ávila) Spain
H29713	1stW.	26.8.60	Dungeness: 50°55'N. 0°59'E. (Kent)
	+	8.9.60	Alfaro: 42°11'N. 1°45'W. (Logroño) Spain

Meadow Pipit (*Anthus pratensis*) (35; 50 miles; $3\frac{1}{12}$ years)

53031	1stW.	5.9.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	()	18.12.60	Mafra: 38°57'N. 9°19'W. (Estremadura) Portugal
89340	juv.	7.7.60	Fair Isle
	v	25.10.60	La Teste-de-Buch: 44°34'N. 1°09'W. (Gironde) France
89409	juv.	22.7.60	Fair Isle
	+	19.11.60	Nazaré: 39°36'N. 9°04'W. (Estremadura) Portugal
89422	juv.	22.7.60	Fair Isle
	+	c. 25.11.60	Aljezur: 37°18'N. 8°49'W. (Algarve) Portugal
89417	juv.	25.7.60	Fair Isle
	×	19.10.60	La Línea: 36°10'N. 5°21'W. (Cádiz) Spain
J36216	juv.	1.8.59	Loch Loyal: 58°23'N. 4°22'W. (Sutherland) S&W
	+	14.1.60	Mondragón: 43°04'N. 2°28'W. (Guipúzcoa) Spain
73558	1stW.	8.9.59	Pateley Bridge: 54°05'N. 1°45'W. (York) S&W
	×	24.1.60	Carquefou: 47°18'N. 1°29'W. (Loire-Atlantique) France

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2105	ad. ×	29.8.59 (26.2.60)	Pateley Bridge S&W St. Vivien: 45°26'N. 1°02'W. (Gironde) France
34143	juv. +	12.8.60 5.10.60	Calf of Man: 54°03'N. 4°49'W. CMRS Santander: 43°28'N. 3°48'W. Spain
2329	juv. ×	1.6.60 0.10.60	Blubberhouses: 53°59'N. 1°45'W. (York) ADW Le Boucau: 43°30'N. 1°28'W. (Basses-Pyrénées) France
8754	ad. +	3.4.60 20.10.60	Ilkley: 53°56'N. 1°49'W. (York) WNS Anglet: 43°29'N. 1°30'W. (Basses-Pyrénées) France
6432	pull. +	13.6.60 7.10.60	Wainstalls: 53°45'N. 1°55'W. (York) HSS St. Martin: 43°33'N. 1°22'W. (Landes) France
2696	f.g. ×	22.11.59 (25.10.60)	near Birkenhead: 53°22'N. 2°59'W. (Cheshire) NH near Cambridge 150m. SE
23180	ad. ♂ +	15.8.60 25.9.60	Minsmere: 52°14'N. 1°37'E. (Suffolk) HEA Orthez: 43°29'N. 0°46'W. (Basses-Pyrénées) France
20386	f.g. +	17.3.58 8.11.60	Great Saltee: 52°07'N. 6°35'W. (Wexford) near Figueira da Foz: 40°11'N. 8°47'W. (Beira Litoral) Portugal
13006	f.g. ×	6.10.57 (24.1.60)	Abberton: 51°50'N. 0°53'E. (Essex) Chenies, Amersham (Buckingham) 58m. W.
894	f.g. +	21.9.59 (26.10.60)	Abberton St. Lubin: 48°45'N. 1°13'E. (Eure-et-Loir) France
55	f.g. ×	15.10.59 10.1.60	Abberton near Etchingham (Sussex) 60m. SSW.
85	f.g. ×	23.10.59 14.1.60	Abberton Bournemouth (Hampshire) 135m. WSW.
1841	f.g. +	27.9.59 29.12.60	Cliffe: 51°28'N. 0°30'E. (Kent) NKRG Vila Franca de Xira: 38°57'N. 8°59'W. (Ribatejo) Portugal
837	1st W. v	26.8.59 c. 19.1.60	Lundy: 51°12'N. 4°40'W. (Devon) Guipavas: 48°27'N. 4°25'W. (Finistère) France
444	1st W. +	23.9.59 7.12.60	Lundy Monte: 43°28'N. 3°50'W. (Santander) Spain

Rock Pipit (*Anthus spinoletta*) (7; 50 miles; 2 $\frac{4}{12}$ years)

392	juv. ×	6.8.57 1.1.60	Fair Isle: 59°32'N. 1°37'W. (Shetland) Macduff (Banff) 130m. SSW.
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Pied/White Wagtail (*Motacilla alba*) (58; 50 miles; 2 $\frac{7}{12}$ years)

81	pull. ×	24.7.59 16.1.60	Tweedsmuir: 55°30'N. 3°27'W. (Peebles) WJE Duddle, Dorchester (Dorset) 350m. S.
21	pull. ×	21.5.59 16.1.60	Moniaive: 55°11'N. 3°55'W. (Dumfries) TT Concoret: 48°04'N. 2°13'W. (Morbihan) France
36	pull. ×	12.6.57 15.1.60	Cumdivock: 54°49'N. 3°01'W. (Cumberland) RHB Montjean: 47°23'N. 0°51'W. (Maine-et-Loire) France
3981	juv. ()	9.6.60 (11.10.60)	Carnforth: 54°08'N. 2°46'W. (Lancashire) JW Tarnos: 43°33'N. 1°27'W. (Landes) France
1127	1st W. ♂ /?	16.9.60 c. 8.11.60	Carnforth IEDP Barcelos: 41°32'N. 8°37'W. (Minho) Portugal
59	pull. /?	24.5.59 (1.1.60)	Wath-on-Deane: 53°31'N. 1°21'W. (York) RJR Tocha: 40°19'N. 8°45'W. (Beira Litoral) Portugal
060	juv. v	19.8.60 5.11.60	Queniborough: 52°42'N. 1°02'W. (Leicester) MB Elm Park, Romford (Essex) 93m. SE.



The only foreign recoveries of Red-backed Shrikes (*Lanius cristatus collurio*) ringed in Britain. The figure by each dot shows the month in which it was recovered (or, in the cases of those in brackets, that in which it was reported)

65817	ad.	7.9.59	Milton: 52°12'N. 0°07'E. (Cambridge) C&PM
	×	(22.2.60)	Leechade (Gloucester) 85m. WSW.
15660	juv.	24.6.59	Abberton: 51°50'N. 0°53'E. (Essex)
	+	19.2.60	Castelo Branco: 39°50'N. 7°30'W. (Beira Baixa) Portugal
40818	juv.	5.10.58	Elm Park: 51°33'N. 0°12'E., Romford (Essex) RRS
	[?]	22.12.59	Aveiro: 40°38'N. 8°40'W. (Beira Litoral) Portugal
181929	juv.	16.7.60	Ashford: 51°09'N. 0°53'E. (Kent) DBO
	+	22.12.60	Mértola: 37°38'N. 7°40'W. (Baixo Alentejo) Portugal

Yellow Wagtail ssp. (*Motacilla flava*) (14; 50 miles; 3½ years)

A82651	juv.	19.7.56	Abberton: 51°50'N. 0°53'E. (Essex)
	+	9.5.60	near Casablanca: 33°39'N. 7°35'W. Morocco
C46922	juv.	15.6.57	Abberton
	[?]	8.10.60	Vila Nova de Milfontes: 37°43'N. 8°47'W. (Baixo Alentejo) Portugal
E93423	ad.	1.7.58	Romford: 51°35'N. 0°11'E. (Essex) 11&W
	()	4.4.60	Torreccera: 36°35'N. 5°58'W. (Cádiz) Spain
93277	juv.	8.8.60	Elm Park: 51°33'N. 0°12'E., Romford (Essex) RRS
	×	9.9.60	West Wittering (Sussex) 70m. SW.
J50855	ad. ♀	12.8.59	East Tilbury: 51°28'N. 0°26'E. (Essex) ABO
	+	2.10.60	near Loures: 38°50'N. 9°10'E. (Estremadura) Portugal

Red-backed Shrike (*Lanius cristatus collurio*) (3; 10 miles; 1½ years)

BA00042	pull.	17.6.60	New Forest: c. 50°55'N. 1°40'W. (Hampshire) JSA
	× A	6.11.60	Schwangau: 47°34'N. 10°44'E. Füssen (Bayern) Germany

This is the first British-ringed Red-backed Shrike to be recovered in Germany.

REPORT ON BIRD-RINGING FOR 1960

Starling (*Sturnus vulgaris*) (1,121; 7 $\frac{1}{12}$ years)

Two hundred Starlings were recovered abroad as follows:

TABLE G—COUNTRIES AND MONTHS OF RECOVERIES OF STARLINGS (*Sturnus vulgaris*)

Country of recovery	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Ireland (2)	—	—	—	—	—	—	—	—	—	—	2	—
Belgium (13)	—	—	—	—	—	—	—	5	5	1	2	—
Netherlands (26*)	1	4	7	4	1	—	2	2	—	(1)	—	1
Denmark (25*)	—	4	4	4	5	5	1	2	—	—	1	—
Norway (15)	2	3	2	5	1	1	1	—	—	—	—	—
Sweden (21)	2	7	4	7	—	(1)	—	—	—	—	—	—
Germany (50)	10	7	9	6	9	3	3	2	—	(1)	—	—
France (11)	3	2	1	—	1	1	1	—	2	—	—	—
U.S. States (4)	—	1	1	1	—	—	1	—	—	—	—	—
Spain (7)	—	1	4	1	—	—	1	—	—	—	—	—
U.S.S.R. (26*)	2	6	7	3	2	1	5	—	—	—	—	—

*Includes undated record(s) omitted from monthly columns
See footnote to Table A

The months of ringing of birds of presumed Continental origin were: October, 13; November, 18; December, 35; January, 62; February, 47; March, 18; and April, 8; extreme dates being 11th October and 25th April.

Forty-nine recoveries at distances of over 100 miles within the British Isles conform, for the most part, to a pattern of westerly movement in the autumn and corresponding return in the spring. Only five of these birds were ringed on dates indicating that they were British breeding stock.

Published in full are the extreme recoveries from north, east and south, and foreign recoveries of birds of probable British origin.

612	1st W. ♂	21.12.55	Avoch: 57°34'N. 4°10'W. (Ross) JL
×		(28.5.60)	Borge: 68°15'N. 13°50'E., Lofoten Isles, Norway
185	f.g. ♂	29.8.59	Knock: 54°35'N. 5°56'W. Belfast GTF
×		16.6.60	Dagsås: 57°04'N. 12°25'E. (Halland) Sweden
868	f.g. ♂	14.11.59	Colchester: 51°53'N. 0°53'E. (Essex) MSJS
×		18.1.60	near Javron: 48°25'N. 0°20'W. (Mayenne) France
347	f.g.	15.12.56	Abberton: 51°50'N. 0°53'E. (Essex)
×		0.8.60	Kum'ya: 56°41'N. 46°41'E., Kilemary (Mariye) U.S.S.R.
116	juv.	22.6.57	Abberton
×		(20.5.60)	Denekamp: 52°23'N. 7°00'E. (Overijssel) Netherlands

Greenfinch (*Chloris chloris*) (277; 100 miles; 3 $\frac{2}{12}$ years)

375	ad. ♀	6.11.59	Spurn Point: 53°35'N. 0°06'E. (York)
v		29.1.60	Simonsberg: 54°26'N. 8°58'E. (Schleswig-Holstein) Germany
9X	f.g.	13.11.60	Burton: 53°16'N. 3°02'W., Wirral (Cheshire) RPC
/?		27.12.60	Flimby, Maryport (Cumberland) 100m. NNW.
1X	f.g.	15.11.59	Burton RPC
×		6.6.60	Scarborough (York) 125m. NE.
309	ad. ♂	28.3.59	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
()		(2.2.60)	Crevecœur: 49°07'N. 0°02'E. (Calvados) France
13—	ad. ♀	c. 4.4.59	Sittingbourne: 51°20'N. 0°41'E. (Kent) WFAB
v		13.1.60	Armentières: 50°41'N. 2°53'E. (Nord) France

BRITISH BIRDS

R47640	1stW. ♂ ×	31.10.59 11.4.60	Dungeness: 50°55'N. 0°59'E. (Kent) Lowestoft (Suffolk) 110m. NNE.
R47170	1stW. ♂ v	5.11.59 c. 25.1.60	Dungeness La Bassée: 50°31'N. 2°49'E. (Pas-de-Calais) France
R47910	f.g. ♂ [?]	6.11.59 (14.1.60)	Dungeness St. Blimont: 50°05'N. 1°33'E. (Somme) France
R66471	ad. ♂ ×	4.2.60 17.4.60	Shoreham-by-Sea: 50°50'N. 0°16'W. (Sussex) JS Ipswich (Suffolk) 100m. NE.

Several species of finch were unusually abundant in the autumn and winter of 1959-60 and there is evidence from ringing that they moved about to an abnormal degree. The recoveries of Greenfinch, Goldfinch, Linnet and Redpoll published in this report should be studied in conjunction with those in the "Report on bird-ringing for 1959" (*Brit. Birds*, 53: 500-501). The reader is also referred to *Bird Migration*, 1(4): 176-181.

Goldfinch (*Carduelis carduelis*) (10; 1 $\frac{1}{12}$ years)

J65015	juv. v	10.8.59 9.5.60	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC Tournai: 50°36'N. 3°24'E. (Hainaut) Belgium
J65218	juv. [?]	2.9.59 14.1.60	Walberswick DBC Archiac: 45°31'N. 0°18'W. (Charente-Maritime) France
J39073	f.g. ×	10.10.59 17.1.60	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex) near Segonzac: 45°37'N. 0°13'W. (Charente) France
K57982	ad. ×	27.4.59 c. 18.1.60	Cholsey: 51°34'N. 1°09'W. (Berkshire) OOS near Morcenx: 44°02'N. 0°55'W. (Landes) France
H12363	juv. ()	23.7.60 1.11.60	Cliffe: 51°28'N. 0°30'E. (Kent) NKRG Calahorra: 42°19'N. 1°58'W. (Logroño) Spain
H31734	juv. v v	13.8.60 24.9.60 12.10.60	Cliffe NKRG Cliffe Momignies: 50°02'N. 4°10'E. (Hainaut) Belgium
32691	ad. ()	24.11.58 27.3.60	Dungeness: 50°55'N. 0°59'E. (Kent) Ortuella: 43°19'N. 3°04'W. (Vizcaya) Spain
1138126	1stW. +	8.10.60 4.12.60	Dungeness Madrid: 40°25'N. 3°43'W. Spain
J38133	f.g. +	27.5.59 (17.5.60)	Hailsham: 50°52'N. 0°16'E. (Sussex) PSR San Sebastian: 43°19'N. 1°59'W. (Guipúzcoa) Spain
AA87945	f.g. +	2.10.60 1.11.60	Beachy Head: 50°44'N. 0°15'E. (Sussex) AQ Las Matas: 40°33'N. 3°53'W. (Madrid) Spain

Siskin (*Carduelis spinus*) (2; 5 miles; 14 days)

1113280	ad. ♂ ()	17.9.60 1.10.60	near Embleton: 55°32'N. 1°37'W. (Northumberland) MHBO Zulte: 50°55'N. 3°27'E. (East Flanders) Belgium
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Linnet (*Carduelis camuabina*) (46; 100 miles; 2 $\frac{10}{12}$ years)

41971	1stW. ()	2.9.58 20.3.60	Bamburgh: 55°36'N. 1°42'W. (Northumberland) MHBO Derio: 43°18'N. 2°52'W. (Vizcaya) Spain
C92195	pull. ×	26.5.57 13.1.60	Spurn Point: 53°35'N. 0°06'E. (York) near Bordeaux: 44°47'N. 0°32'W. (Gironde) France
74624	ad. ♂ ()	25.9.59 19.3.60	Bamburgh MHBO Vitoria: 42°51'N. 2°40'W. (Alva) Spain

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77895	f.g. ♀ +	10.4.59 (30.4.60)	Spurn Point Sestao: 43°18'N. 3°00'W. (Vizcaya) Spain
87685	f.g. ♂ ×	20.4.60 18.10.60	Spurn Point Onesse: 44°12'N. 0°52'W. (Landes) France
87763	f.g. ♂ +	23.4.60 15.10.60	Spurn Point Soustons: 43°45'N. 1°19'W. (Landes) France
A63019	f.g. ♂ +	27.9.60 4.12.60	Spurn Point Zaragoza: 41°39'N. 0°54'W. Spain
99017	pull. +	31.5.59 (7.11.60)	Knowsley: 53°27'N. 2°52'W. (Lancashire) AMW Basauri: 43°13'N. 2°54'W. (Vizcaya) Spain
73305	juv. ×	29.7.59 17.1.60	Walberswick: 52°18'N. 1°41'E. (Suffolk) DBC Bruges: 44°53'N. 0°32'W. (Gironde) France
73415	juv. +	5.8.59 c. 9.1.60	Walberswick DBC Vitoria, Spain
89940	f.g. +	28.8.60 16.10.60	Radlett: 51°42'N. 0°19'W. (Hertford) C&C Dax: 43°43'N. 1°03'W. (Landes) France
5758	ad. ♀ ×	26.4.59 19.12.60	Foulness: 51°36'N. 0°55'E. (Essex) GD Alora: 36°50'N. 4°43'W. (Malaga) Spain
2629	f.g. [?]	15.8.59 (2.2.60)	Cliffe: 51°28'N. 0°30'E. (Kent) G&W near Rochefort: 45°56'N. 1°02'W. (Charente-Maritime) France
6697	f.g. ♂ ×	5.9.59 c. 18.1.60	Cliffe G&W Pugnac: 45°05'N. 0°30'W. (Gironde) France
236	1st W. ×	12.9.59 17.1.60	Cliffe G&W Le Havre: 49°30'N. 0°06'E. (Seine-Maritime) France
11542	juv. ×	31.7.60 20.11.60	Cliffe NKRK Bassanne: 44°32'N. 0°05'W. (Gironde) France
1618	ad. ♂ ×	6.8.60 28.12.60	Cliffe NKRK Crué: 47°04'N. 0°11'E. (Vienne) France
8613	juv. +	24.6.60 7.12.60	near Deal: 51°14'N. 1°24'E. (Kent) AP Belict: 44°31'N. 0°47'W. (Gironde) France
0755	pull. ()	26.5.60 (5.12.60)	Dungeness: 50°55'N. 0°59'E. (Kent) Guarromán: 38°11'N. 3°41'W. (Jaén) Spain
5108	ad. ♀ ×	27.4.58 end 1.60	Portland Bill: 50°31'N. 2°27'W. (Dorset) Salles: 44°33'N. 0°52'W. (Gironde) France
38756	f.g. v	25.9.60 13.10.60	Portland Bill Dax: 43°43'N. 1°03'W. (Landes) France
332	f.g. ♂ ×	2.5.60 11.7.60	St. Agnes: 49°53'N. 6°21'W., Scilly (Cornwall) SABO Quimper: 48°00'N. 4°06'W. (Finistère) France
43810	juv. v	13.9.60 21.10.60	St. Agnes SABO Lundy (Devon) 112m. NE.

Redpoll (*Carduelis flammea*) (5; 10 miles; $\frac{8}{15}$ year)

12	ad. ♀ +	24.8.59 27.10.59	Howick: 55°27'N. 1°36'W. (Northumberland) MHBO Izel: 49°42'N. 5°22'E. (Luxembourg) Belgium
23	ad. ♂ × A	3.1.60 (6.6.60)	Broadstone: 50°48'N. 2°00'W. (Dorset) RJJ near Coylton (Ayr) 340m. NNW.
16067	f.g. [?]	21.2.60 end 6.60	near Christchurch: 50°46'N. 1°47'W. (Hampshire) FRC near Scarborough (York) 250m. NNF.
02	ad. ♂ ×	21.2.60 c. 8.7.60	near Christchurch DJG near Ingleton (York) 235m. N.

Chaffinch (*Fringilla coelebs*) (84; 50 miles; 6 $\frac{11}{12}$ years)

73626	f.g. ♂ +	8.11.59 13.11.60	Gouthwaite: 54°07'N. 1°47'W. (York) S&W Degenbol: 56°02'N. 8°24'E. (Jutland) Denmark
J37282	ad. ♂ ×	30.1.60 23.6.60	Ossett: 53°41'N. 1°35'W. (York) AF Morpeth (Northumberland) 100m. N.
J87306	1stW. ♀ +	27.3.60 (22.11.60)	Spurn Point: 53°35'N. 0°06'E. (York) Chediston, Halesworth (Suffolk) 100m. SE.
J86147	ad. ♂ ×	28.3.60 4.4.60	Spurn Point Hallum: 53°18'N. 5°47'E. (Friesland) Netherlands
J87379	f.g. ♀ ×	2.4.60 14.4.60	Spurn Point Schiermonnikoog: 53°28'N. 6°10'E., Frisian Islands, Netherlands
J20186	f.g. ♀ v	6.10.59 31.10.60	Spurn Point Heligoland: 54°11'N. 7°55'E. Germany
K71799	1stW. ♂ v	13.12.58 10.4.60	Walton: 53°22'N. 2°36'W., Warrington (Lancashire) RPC Heligoland, Germany
K12907	f.g. ♀ ×	1.3.58 3.4.60	Eastham: 53°18'N. 2°59'W., Wirral (Cheshire) NH Haarlem: 52°23'N. 4°38'E. (Noord-Holland) Netherlands
A.116139	f.g. ♂ ×	6.2.60 27.3.60	Burton: 53°16'N. 3°02'W., Wirral (Cheshire) RPC IJmuiden: 52°28'N. 4°38'E. (Noord-Holland) Netherlands
79127	1stW. ♀ v	9.4.60 15.10.60	Bardsey: 52°46'N. 4°48'W. (Caernarvon) near Sittingbourne (Kent) 250m. ESE.
J46592	ad. ♂ |?|	17.1.60 15.3.60	Earlswood: 52°20'N. 1°47'W. (Warwick) KHT Devermühlen: 53°01'N. 7°22'E. (Niedersachsen) Germany
E85467	f.g. ♂ ×	27.12.57 4.4.60	Wickford: 51°38'N. 0°31'E. (Essex) MRC Friedeburg: 53°28'N. 7°49'E. (Niedersachsen) Germany
F19021	ad. ♂ ()	8.3.58 17.10.60	Elm Park: 51°33'N. 0°12'E., Romford (Essex) RRS Ingooigem: 50°49'N. 3°27'E. (West Flanders) Belgium
K95237	ad. ♂ ×	7.4.59 15.6.60	Sittingbourne: 51°20'N. 0°41'E. (Kent) WFAB Abingdon (Berkshire) 85m. WNW.
E48292	f.g. ♀ ×	15.12.57 12.4.60	Guildford: 51°14'N. 0°35'W. (Surrey) NJW Bielefeld: 52°02'N. 8°32'E. (Nordrhein-Westfalen) Germany
76796	1stW. ♀ ()	13.10.59 14.10.60	Lundy: 51°12'N. 4°40'W. (Devon) Awirs: 50°36'N. 5°24'E. (Liège) Belgium
K89642	f.g. ♀ ()	27.2.59 5.11.60	near Hythe: 51°06'N. 1°04'E. (Kent) HS Flarebeke: 50°51'N. 3°19'E. (West Flanders) Belgium
27670	f.g. ♀ ×	19.12.57 10.11.60	Burmarsh: 51°03'N. 1°00'E. (Kent) DBO Neukloster: 53°28'N. 9°39'E. (Niedersachsen) Germany
C.11588	ad. ♂ ×	24.10.56 25.10.60	Brenzett: 51°01'N. 0°52'E. (Kent) DBO Apeldoorn: 52°13'N. 5°56'E. (Gelderland) Netherlands
77719	f.g. ♀ ×	6.10.59 21.5.60	Holwell: 50°56'N. 1°54'W. (Dorset) RHI Stensjön: 57°35'N. 14°50'E. (Jönköping) Sweden
F22535	ad. ♀ v	14.11.58 23.10.60	Blandford: 50°52'N. 2°08'W. (Dorset) BS St. Niklaas: 51°10'N. 4°09'E. (East Flanders) Belgium
E69150	f.g. ♀ ×	21.12.57 11.4.60	near Christchurch: 50°44'N. 1°44'W. (Hampshire) FRC North Mimms (Hertford) 92m. NE.

Brambling (*Fringilla montifringilla*) (4; 80 miles; $\frac{4}{12}$ year)

83778	f.g. ♀	14.10.59	Spurn Point: 53°35'N. 0°06'E. (York)
	[?]	16.1.60	Bidart: 43°26'N. 1°35'W. (Basses-Pyrénées) France

This is the first British-ringed Brambling to be recovered in southern Europe.

Reed Bunting (*Emberiza schoeniclus*) (12; 30 miles; $1\frac{8}{12}$ years)

3563	f.g. ♀	6.10.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	×	16.1.60	Ste. Eulalie-en-Born: 44°17'N. 1°10'W. (Landes) France
39345	1st W. v	5.12.59	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
		17.4.60	Film Park, Romford (Essex) 33m. WSW.
5216	1st W. ♂	13.12.59	Elm Park: 51°33'N. 0°12'E., Romford (Essex) RRS
	v	19.3.60	Dungeness (Kent) 53m. SE.
	v	29.4.60	Dungeness

3563 is the first British-ringed Reed Bunting to be recovered abroad.

Snow Bunting (*Plectrophenax nivalis*) (10; 5 miles; 1 year)

81654	ad. ♂	7.4.59	Fair Isle: 59°32'N. 1°37'W. (Shetland)
	()	1.5.60	Tilting: 49°42'N. 54°05'W., Fogo Island, Newfoundland
85401	1st W. ♂	30.12.59	Spurn Point: 53°35'N. 0°06'E. (York)
	×	14.3.60	Tankerness, Mainland (Orkney) 38m. NNW.
2782	f.g. ♂	6.1.60	Sandwich Bay: 51°17'N. 1°20'E. (Kent) SBRS
	v	10.1.60	Zeebrugge: 51°20'N. 3°13'E. (West Flanders) Belgium
	x	14.2.60	Zeebrugge
2808	f.g. ♂	6.1.60	Sandwich Bay SBRS
	v	29.11.60	Knokke: 51°21'N. 3°19'E. (West Flanders) Belgium

81654 is the first British-ringed Passerine to be recovered in the New World. It seems probable that the bird originated in Greenland and wintered on different sides of the Atlantic in successive winters.

House Sparrow (*Passer domesticus*) (262; 30 miles; $5\frac{11}{12}$ years)

994	f.g. ♀	15.1.60	Spurn Point: 53°35'N. 0°06'E. (York)
	×	17.6.60	North Cave, Market Weighton (York) 32m. WNW.
7587	ad. ♂	27.10.57	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
	×	0.11.60	Quidenham, Harling (Norfolk) 46m. N.
5318	f.g. ♂	16.1.59	Littlestone: 50°59'N. 0°58'E. (Kent) DBO
	×	28.12.60	Felixstowe (Suffolk) 62m. NNE.
549	ad. ♂	15.5.60	Dungeness
	×	19.11.60	near Ypres: 50°50'N. 2°55'E. (West Flanders) Belgium
400	f.g. ♀	26.7.59	Portland Bill: 50°31'N. 2°27'W. (Dorset)
	×	11.2.60	Cherbourg: 49°38'N. 1°37'W. (Manche) France

549 and K83400 are the first British-ringed House Sparrows to be recovered abroad. Although assisted passage cannot be ruled out, it is of interest to note that these recoveries occurred in seasons when both sparrows and finches showed marked signs of wandering.

Tree Sparrow (*Passer montanus*) (12; 5 miles; $2\frac{4}{12}$ years)

40	f.g.	8.11.59	Littlebourne: 51°16'N. 1°11'E. (Kent) SBRS
	×	28.6.60	Rilland-Bath: 51°25'N. 4°11'E. (Zeeland) Netherlands

40 is only the second British-ringed Tree Sparrow to be recovered abroad.

KEY TO RINGERS' INITIALS IN LIST OF RECOVERIES

Ringers' initials are omitted from the recovery list when the ringing was carried out: (i) at one of the following observatories—Bardsey, Bradwell, Cley, Copeland, Dungeness, Fair Isle, Gibraltar Point, Lundy, Isle of May, Portland, Great Saltee, Skokholm and Spurn; (ii) at Abberton Reservoir, where all ringing is undertaken by Major-General C. B. Wainwright; (iii) on the Farne Islands, where all ringing is organised by the Northumberland, Durham & Newcastle N.H.S.; (iv) by the Wildfowl Trust (nearly all ducks and geese).

HEA	H. E. Axell	HGH	H. G. Hurrell
JSA	J. S. Ash	MPII	M. P. Harris
JWA	J. W. Allen	NII	N. Henson
CGB	C. G. Booth	RFH	R. F. Hemsley
CTB	C. T. Beverley	EGI	Edward Grey Institute
EB	E. Balfour	EEJ	E. E. Jackson
EJB	E. J. Byrne	RJJ	R. J. Jackson
GeB	G. Beven	RAFK	R. A. F. Kemp
GB	G. Bird	HL	H. Lapworth
GRB	G. R. Bennett	JL	the late Rev. J. Lees
HAB	H. A. Bilby	CKM	C. K. Mylne
JAB	J. A. Benington	DJM	D. J. Millin
JASB	J. A. S. Borrett	HPM	H. P. Medhurst
JJB	J. J. Boon	JM	J. MacGeoch
JVB	J. V. Bateman	JMM	J. M. McMeeking
MB	M. Boddy	PPM	P. P. Mackie
PAB	P. A. Banks	JFN	J. F. Naylor
RB	R. H. Baillie	RKN	R. K. Norman
RIIB	R. H. Brown	ABO	A. B. Old
TB	T. Boyd	CO	C. Oakes
TBB	T. B. Bagenal	CBO	Copeland Bird Observatory
TLB	T. L. Bartlett	CIBO	Cley Bird Observatory
WFAB	W. F. A. Buck	DBO	Dungeness Bird Observatory
CEJC	C. E. J. Carter	JHO	J. Hughes Onslow
DC	D. Cabot	MHBO	Monks' House Bird Observ- atory
DBC	Dingle Bird Club	SABO	St. Agnes Bird Observatory
DFC	Dublin Field Club	SBO	Skokholm Bird Observatory
DMC	D. M. Cormack	AP	A. Pettet
FRC	F. R. Clifton	DJP	D. J. Pearson
GDC	G. D. Craine	EDP	E. D. Ponting
JCC	J. C. Coulson	EGP	E. G. Philp
LC	Mrs. L. Cave	NDP	N. D. Pullen
MOC	Midlothian Orn. Club	RP	R. Perry
MRC	M. R. Chettleburgh	WMP	W. M. Peet
RPC	R. P. Cockbain	AQ	A. Quinn
EAGD	E. A. G. Duffey	CMR	C. M. Reynolds
GD	G. Downey	MPMR	M. P. M. Richards
BE	B. Ebert	PSR	P. S. Redman
PRE	P. R. Evans	PR	P. Rudge
TE	T. Ennis	RJR	R. J. Rhodes
WJE	W. J. Eggeling	AS	Ackworth School
AF	A. Frudd	BS	Bryanston School
GTF	G. T. Flock	CHRS	Christchurch Harbour Ring- ing Station
JEF	J. E. Flynn	CMRS	Calf of Man Ringing Station
ROMF	R. O. M. Ford	IIS	I. Schreiber
DJG	D. J. Godfrey	IIS	Halifax Scientific Society
GRG	Guildford Ringing Group	JS	J. Stafford
JCG	J. C. Gittins	JHS	J. Stafford (I. of W.)
NKR	North Kent Ringing Group	LNHS	London Natural History Society
TWG	T. W. Gladwin	MSJS	M. S. J. Snoxell
WWRG	Wash Wader Ringing Group		
DDH	D. D. Harber		
DFH	D. F. Harle		

FOREIGN-RINGED RECOVERIES

NS	N. Syer	CW	C. Winn
OOS	Oxford Ornithological Society	DCHW	D. C. H. Worsfold
RS	R. Stokoe	DRW	D. R. Wilson
RBS	R. B. Shelley	EHW	E. H. Webb
RRS	Romford Ringing Station	GLW	G. L. Webber
RWJS	R. W. J. Smith	JW	J. Wilson
SS	Sedbergh School	NJW	N. J. Westwood
SBRs	Sandwich Bay Ringing Station	A&R	Ash & Ridley
SNHS	Sorby Natural History Society	C&C	Card & Card
WNS	Wharfedale Naturalists' Society	CE&Q	Carter, Edwards & Quinn
CJRT	C. J. R. Thorne	C&L	Clissold & Little
KHT	K. H. Thomas	C&PM	C. & P. Minton
TT	T. Todd	D&Q	Dickens & Quin
AU	Aberdeen University	F&M	Flegg & Musson
AEV	A. E. Vine	G&W	Glanville & Walker
AAKW	A. A. K. Whitehouse	H&M	Hamilton & Macgregor
ACW	A. C. Whiteside	H&W	Hurrell & Waite
ADW	A. D. Wright	I&R	Iles & Rushforth
AMW	A. M. Woods	ND&N	Northumberland, Durham & Newcastle N.H.S.
		P&B	Pyman & Barton
		S&W	Sanderson & Walker
		W&M	Watts & McConville

Recoveries in Great Britain and Ireland of birds ringed abroad

By E. P. Leach

Selected list of recoveries reported

The symbols and terms are the same as those used in the "Report on bird-ringing" (page 458), with the exception that the term "juv." cannot always be relied on to signify a young bird that is able to fly freely: owing to lack of unanimity in the various ringing schemes, this term may sometimes mean a nestling or chick.

Abbreviations used for ringing stations

Brussels	O.	Oslo
Copenhagen	P.	Paris
Gothenburg	P.V.	Polonia Varsovia (Poland)
Heligoland	Port.	University of Oporto
Helsinki	R.	Radolfzell (ex-Rossitten)
R.S. Helsinki Riista Säätiö (Game Research Institute)	Rk.	Reykjavik
Game Biology Station, Kalö, Denmark	Star.	Stavanger
Leiden	St.	Stockholm
Moscow	St. Orn.	Stockholm "Ornis" (Sveriges Ornithologiska Förening)
Oslo Statensviltundersökelse (State Game Research)	S.J.F.	Svenska Jägare Förbundet
	Troms.	Tromsø Museum

Heron (*Ardea cinerea*)

<i>Stav.</i>	pull	25.5.53	Sund: 60°17'N. 5°10'E. (Hordaland) Norway
023526	x	2.2.60	Burtonport: 54°58'N. 8°27'W. (Donegal)
<i>O.</i>	pull.	9.6.56	Egersund: 58°28'N. 6°00'E. (Rogaland) Norway
057111	x	28.1.57	Glenbuchat: 57°12'N. 3°00'W. (Aberdeen)
<i>O.</i>	pull.	2.7.56	Egersund, Norway
057084	x	c. 25.10.57	Loch Eport: 57°34'N. 7°10'W. North Uist
<i>O.</i>	pull.	2.7.56	Egersund, Norway
057121	+	5.2.57	Ennistimon: 52°55'N. 9°20'W. (Clare)

Mallard (*Anas platyrhynchos*)

<i>Hki.</i>	juv. ♂	21.7.58	Pori: 61°30'N. 21°45'E. Finland
H25816	+	6.2.60	Levens: 54°16'N. 2°47'W. (Westmorland)
<i>Hki.</i>	juv. ♀	23.6.59	Isojoki: 62°08'N. 21°45'E. Finland
H33053	+	1.1.60	Lilliesleaf: 55°31'N. 2°43'W. (Roxburgh)
<i>S.J.F.</i>	juv.	3.7.59	Örebro: 59°16'N. 15°14'E. Sweden
107567	v	15.1.60	transported Borgviksbruk: 59°21'N. 12°58'E. Ludham: 52°42'N. 1°33'E. (Norfolk)
<i>Kalö</i>	juv.	25.7.59	Vest Stadil Fjord: 56°12'N. 8°10'E. (Jutland) Denmark
304751	x A	25.7.60	near Walsingham: 52°54'N. 0°49'E. (Norfolk)
<i>Kalö</i>	juv.	25.7.59	Vest Stadil Fjord, Denmark
304775	+	13.10.60	Grantshouse: 55°53'N. 2°18'W. (Berwick)

Teal (*Anas crecca*)

<i>Rk.</i>	pull.	28.7.54	Fnjóskadalur: 65°46'N. 17°53'W. Iceland
67368	+	18.12.60	R. Shannon estuary, Ireland
<i>Hki. R.S.</i>	ad. ♂	12.5.60	near Oulu: 65°03'N. 25°35'E. Finland
11903	+	1.10.60	Moirra: 54°29'N. 6°14'W. (Down)
<i>M.</i>	juv.	29.7.58	Zagub'e Bay: 60°28'N. 32°50'E. Lake Ladoga, U.S.S.R.
E370947	+	18.11.59	Kilmore: 52°12'N. 6°33'W. (Wexford)
<i>P.</i>	1stW. ♂	6.12.57	Le Sambuc: 43°31'N. 4°42'E. (Bouches-du-Rhône) France
CA7074	+	23.1.60	Swithland: 52°44'N. 1°11'W. (Leicester)
<i>P.</i>	1stW. ♂	31.12.57	Le Sambuc, France
EC9917	v Jan. & Feb. 58		Le Sambuc
	+	12.1.60	Audlem: 52°59'N. 2°31'W. (Cheshire)
<i>P.</i>	♂	7.1.58	Le Sambuc, France
DB7609	v	4.4.58	Le Sambuc
	+	c. 20.1.60	Birgham: 55°38'N. 2°19'W. (Berwick)
<i>P.</i>	1stW. ♂	12.12.58	Le Sambuc, France
ED7762	+	15.10.60	Aldeburgh: 52°09'N. 1°36'E. (Suffolk)
<i>P.</i>	1stW. ♂	26.1.59	Le Sambuc, France
EE0812	+	28.11.60	Carrigtwohill: 51°54'N. 8°15'W. (Cork)
<i>P.</i>	1stS. ♀	11.4.59	Le Sambuc, France
EF4453	+	30.1.60	Kent Estuary: c. 54°15'N. 2°45'W. (Westmorland)
<i>P.</i>	♂	11.4.60	Le Sambuc, France
E17188	+	14.10.60	Fawley: 50°49'N. 1°20'W. (Hampshire)

EC9917 evidently spent the whole of its first winter in the south of France: after being ringed at Le Sambuc in December 1957, it was retrapped there in both January and February 1958.

FOREIGN-RINGED RECOVERIES

Garganey (*Anas querquedula*)

f.g.	17.8.55	Giethoorn: 52°44'N. 6°04'E. (Overijssel) Netherlands
+	23.11.57	Cobh: 51°51'N. 8°17'W. (Cork)
1stW. ♀	4.9.56	Haarsteeg: 51°43'N. 5°13'E. (Noord-Brabant) Netherlands
+	4.9.58	Lincoln: 53°14'N. 0°33'W.
f.g.	0.8.58	Engwierum: 53°20'N. 6°09'E. (Friesland) Netherlands
+	3.9.58	Burnham Overy: 52°58'N. 0°46'E. (Norfolk)

Wigeon (*Anas penelope*)

ad. ♀	31.5.59	Skipalón: 65°47'N. 18°12'W. Iceland
+	25.10.60	Dingwall: 57°36'N. 4°26'W. (Ross)
pull.	2.8.60	Skipalón, Iceland
+	23.11.60	Alness: 57°41'N. 4°15'W. (Ross)
1stW. ♂	19.10.54	Texel: 53°06'N. 4°48'E. Netherlands
+	15.1.57	R. Swale: 51°25'N. 0°41'E. (Kent)
f.g.	25.1.55	Wieringen: 52°54'N. 4°56'E. (Noord-Holland) Netherlands
+	Feb./Mar. 57	Norfolk
ad. ♂	14.1.57	Haarsteeg: 51°43'N. 5°13'E. (Noord-Brabant) Netherlands
+	11.2.58	Ipswich: 52°05'N. 1°10'E. (Suffolk)
ad. ♂	11.3.57	Haarsteeg, Netherlands
+	11.2.59	Lusmagh: 53°10'N. 8°04'W. (Offaly)
1stW. ♂	30.1.58	Haarsteeg, Netherlands
+	31.1.59	Baldoyle: 53°24'N. 6°07'W. (Dublin)
1stW. ♂	19.2.58	Haarsteeg, Netherlands
+	9.1.59	Shercock: 54°00'N. 6°54'W. (Cavan)
♂	15.3.58	Haarsteeg, Netherlands
+	20.11.58	Poulnasherry Bay: 52°37'N. 9°33'W. (Clare)
1stW. ♀	23.1.59	Haarsteeg, Netherlands
+	13.12.59	Foulness: 51°36'N. 0°53'E. (Essex)
1stW. ♂	3.11.56	Lekkerkerk: 51°54'N. 4°39'E. (Zuid-Holland) Netherlands
+	9.1.59	Dungarvan Bay: 52°04'N. 7°35'W. (Waterford)
f.g.	14.11.56	Meetkerke: 51°14'N. 3°09'E. (West Flanders) Belgium
+	16.1.60	Woodbridge: 52°06'N. 1°19'E. (Suffolk)
f.g.	1.1.57	Meetkerke, Belgium
+	14.9.59	Lough Erne: c. 54°30'N. 7°50'W. (Fermanagh)
ad. ♀	16.2.58	Meetkerke, Belgium
+	10.12.59	Shrewsbury: 52°43'N. 2°45'W. (Shropshire)

Pintail (*Anas acuta*)

R.S.	pull.	19.6.60	Pori: 61°30'N. 21°45'E. Finland
9	+	16.12.60	Witherslack: 54°16'N. 2°53'W. (Westmorland)
	♂	25.2.57	Haarsteeg: 51°43'N. 5°13'E. (Noord-Brabant) Netherlands
12	+	9.1.59	North Wootton: 52°48'N. 0°26'E. (Norfolk)

Shoveler (*Spatula clypeata*)

juv. ♂	5.6.59	Puhtu: 58°34'N. 23°34'E. Estonian S.S.R.
v	5.6.60	Abberton: 51°50'N. 0°53'E. (Essex)

BRITISH BIRDS

G.	♀	19.6.59	Långbådarna: 60°32'N. 18°03'E. (Uppland) Sweden
D46787	+	19.12.60	Edgerley: 52°46'N. 2°58'W. (Shropshire)
L.	juv. ♀	26.7.60	Brabantse Biesbos: c. 51°45'N. 4°48'E. Netherlands
4001408	+	3.9.60	Leighton Moss: 54°10'N. 2°48'W. (Lancashire)
L.	♂	11.7.59	Brabantse Biesbos, Netherlands
4001082	+	9.9.59	Ravenglass: 53°22'N. 3°26'W. (Cumberland)
L.	f.g.	1.9.56	Naardermeer: 52°18'N. 5°08'E. (Noord-Holland) Netherlands
346402	+	11.9.57	Newcastle upon Tyne: 54°56'N. 1°33'W. (Northumberland)
L.	f.g.	9.9.57	Naardermeer, Netherlands
346452	+	0.1.58	Buttevant: 52°14'N. 8°40'W. (Cork)
L.	1stW. ♂	9.9.55	Lekkerkerk: 51°55'N. 4°43'E. (Zuid-Holland) Netherlands
269525	+	1.1.59	Kilmore: 52°12'N. 6°33'W. (Wexford)
L.	1stW. ♂	2.11.57	Lekkerkerk, Netherlands
268272	+	30.1.59	Highbridge: 51°11'N. 2°52'W. (Somerset)
L.	♂	9.12.59	Lekkerkerk, Netherlands
297029	+	17.12.59	Littleport: 52°28'N. 0°19'E. (Cambridge)
L.	ad.	13.8.59	Anna Jacoba polder: 51°38'N. 4°08'E. (Zeeland) Netherlands
348628	+	29.11.59	Thurles: 52°41'N. 7°49'W. (Tipperary)
L.	1stW. ♀	1.10.57	Herwijnen: 51°51'N. 5°07'E. (Gelderland) Netherlands
379735	+	30.11.57	Mizen Head: 52°52'N. 6°05'W. (Wicklow)

Scaup (*Aythya marila*)

Rk.	ad. ♂	5.5.56	Myvatn: 65°39'N. 16°58'W. Iceland
33584	+	3.1.60	South Slob: c. 52°20'N. 6°28'W. (Wexford)

Pochard (*Aythya ferina*)

Hki.	juv. ♂	20.7.60	Pori: 61°30'N. 21°45'E. Finland
H34826	×	6.11.60	Feltham: 51°28'N. 0°25'W. (Middlesex)

Shelduck (*Tadorna tadorna*)

H.	f.g.	31.8.58	R. Weser estuary, Germany
366899	×	13.5.60	Rockcliffe Marsh: 54°58'N. 3°04'W. (Cumberland)

White-fronted Goose (*Anser albifrons*)

L.	ad. ♂	14.2.58	Iloge Warren: 53°06'N. 5°56'E. (Friesland) Netherlands
350210	+	29.1.59	Slimbridge: 51°45'N. 2°24'W. (Gloucester)
L.	ad.	4.1.58	Bunschoten: 52°14'N. 5°22'E. (Utrecht) Netherlands
350024	×	14.10.60	R. Camel estuary: 50°32'N. 4°57'W. (Cornwall)

In addition, the ring numbers of five others at Slimbridge were read by telescope at short range, four of them in March 1959 and the last one in December 1959. One of these (304387) had previously been recovered and released there in February 1958 (*Brit. Birds*, 52: 485). The ringing details are as follows:

262684	ad. ♀	3.2.55	Bunschoten, Netherlands
304387	ad. ♂	16.3.56	Bunschoten, Netherlands
350155	1stW. ♀	8.2.58	Bunschoten, Netherlands
304970	ad. ♀	16.12.58	Iloge Warren, Netherlands
304958	ad. ♀	16.12.58	Iloge Warren, Netherlands

Pink-footed Goose (*Anser arvensis brachyrhynchus*)

av.	f.g.	14-16.7.54	Reindalen: 77°50'N. 15°30'E. Spitzbergen
195215	×	12.2.59	Portsoy: 57°41'N. 2°41'W. (Banff)

Many Pink-footed Geese marked in central Iceland by the 1951 and 1953 expeditions are still being shot in their British winter-quarters, but as the localities show no change from year to year the records are not being given in detail.

Brent Goose (*Branta bernicla*)

av.	ad. ♂	16.7.54	Reindalen: 77°50'N. 15°30'E. Spitzbergen
19099	×	28.1.59	Holy Island: 55°40'N. 1°45'W. (Northumberland)

Kestrel (*Falco tinnunculus*)

13162	f.g.	17.6.58	Le Zoute: 51°20'N. 3°17'E. (West Flanders) Belgium
	×	3.1.60	Birchington: 51°23'N. 1°19'E. (Kent)

Oystercatcher (*Haematopus ostralegus*)

1338	ad.	23.6.56	Midnes: 64°04'N. 22°43'W. Iceland
	×	1.1.60	Glenacardoch Point: 55°33'N. 5°42'W. (Argyll)
1732	pull.	7.6.54	Westmann Is: 63°24'N. 20°17'W. Iceland
	+	16.8.60	Toomebridge: 54°46'N. 6°27'W. (Antrim)
1322	pull.	22.6.29	Texel: c. 53°06'N. 4°47'E. Netherlands
	+	1.12.57	Pakefield: 52°27'N. 1°44'E. (Suffolk)

is most remarkable that this last Oystercatcher should have attained an age of $\frac{1}{2}$ years, but close investigations into the circumstances of both ringing and recovery have shown no reason for the record to be doubted.

Lapwing (*Vanellus vanellus*)

12463	pull.	10.5.57	near Stavanger: 58°58'N. 5°46'E. Norway
	+	9.2.59	St. John: 49°15'N. 2°09'W. Jersey, Channel Is.
1096	pull.	9.5.48	Amager: 55°40'N. 12°38'E. (Sjaelland) Denmark
	+	24.1.55	Clara: 53°20'N. 7°36'W. (Offaly)
1864	pull.	12.5.49	Amager, Denmark
	+	11.11.56	Mullingar: 53°32'N. 7°20'W. (Westmeath)
16088	pull.	12.5.52	Korsör: 55°20'N. 11°09'E. (Sjaelland) Denmark
	×	6.2.56	Jacobstow: 50°45'N. 4°32'W. (Cornwall)
13690	pull.	23.5.59	Neuhaus/Oste: 53°48'N. 9°03'E. Germany
	×	5.3.60	Wolf's Castle: 51°54'N. 4°58'W. (Pembroke)
1022	pull.	30.5.57	Ureterp: 53°06'N. 6°10'E. (Friesland) Netherlands
	× (wires)	31.12.57	Cahirciveen: 51°57'N. 10°13'W. (Kerry)
15511	pull.	13.5.59	Eefde: 52°10'N. 6°14'E. (Gelderland) Netherlands
	v	10.9.59	Holwell: 50°55'N. 2°26'W. (Dorset)
16067	pull.	1.6.57	Texel: c. 53°06'N. 4°47'E. Netherlands
	× (wires)	10.9.57	Melton: 53°45'N. 0°30'W. (York)
16631	pull.	10.5.58	Rensse: 51°44'N. 3°45'E. (Zeeland) Netherlands
	×	20.3.59	Hawkhurst: 51°03'N. 0°31'E. (Kent)

BRITISH BIRDS

L.	ad. ♀	28.11.53	Reeuwijk: 52°03'N. 4°43'E. (Zuid-Holland) Netherlands
241234	×	27.3.59	Biggleswade: 52°07'N. 0°15'W. (Bedford)
L.	ad. ♀	10.3.54	Reeuwijk, Netherlands
241445	×	7.12.58	Grasby: 53°32'N. 0°21'W. (Lincoln)
L.	ad. ♂	21.3.55	Reeuwijk, Netherlands
242802	×	(5.2.57)	East Winch: 52°43'N. 0°32'E. (Norfolk)
L.	1st W. ♀	4.12.55	Reeuwijk, Netherlands
243182	+	8.1.58	Earsham: 52°27'N. 1°24'E. (Norfolk)

Golden Plover (*Charadrius apricarius*)

Rk.	pull.	15.7.57	Arnanes: 66°08'N. 16°44'W. (Kelduhverfi) Iceland
66813	×	17.10.60	Coolick: 52°08'N. 9°31'W. (Kerry)
Rk.	f.g.	25.9.59	Midnes: 64°04'N. 22°43'W. Iceland
612080	+	4.10.60	North Slob: 52°20'N. 6°28'W. (Wexford)
Rk.	f.g.	26.7.60	Midnes, Iceland
612143	+	3.11.60	Castleplunket: 53°46'N. 8°20'W. (Roscommon)
Rk.	f.g.	4.10.60	Midnes, Iceland
612202	+	30.10.60	South Kerry mountains: c. 51°55'N. 9°50'W. (Kerry)

Turnstone (*Arenaria interpres*)

Stav.	f.g.	17.9.59	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway
755336	v	26.8.60	Bradwell-on-Sea: 51°44'N. 0°54'E. (Essex)
Stav.	f.g.	18.9.60	Revtangen, Norway
738712	+	4.11.60	R. Eden estuary: c. 56°23'N. 2°53'W. (Fife)

Snipe (*Gallinago gallinago*)

Rk.	pull.	29.6.55	Westmann Is.: 63°24'N. 20°17'W. Iceland
77142	+	28.1.60	Kilkec: 52°41'N. 9°39'W. (Clare)
Rk.	pull.	14.8.56	Róðhóll: 66°00'N. 19°12'W. Iceland
77847	+	18.2.60	Lough Talt: 54°06'N. 8°56'W. (Sligo)
C.	ad.	22.4.54	Amager: 55°40'N. 12°38'E. Denmark
786305	+	31.1.56	Hastings: 50°51'N. 0°36'E. (Sussex)
C.	juv.	17.8.55	Amager, Denmark
699163	+	28.1.56	Lough Neagh, Northern Ireland
H.	pull.	30.5.54	Hornburg: 53°31'N. 9°35'E. (Hanover) Germany
6182272	+	15.1.60	Woolhampton: 51°24'N. 1°10'W. (Berkshire)
R.	f.g.	12.8.59	Leipzig: 51°20'N. 12°20'E. (Sachsen) Germany
F6389	+	16.1.60	Pulborough: 50°57'N. 0°31'W. (Sussex)
R.	f.g.	22.7.58	Forberge: 51°20'N. 13°17'E. (Sachsen) Germany
F15021	×	21.1.60	Barrow Gurney: 51°25'N. 2°42'W. (Somerset)
L.	1st W.	10.9.58	Zwarte Meer: 52°37'N. 5°54'E. (Overijssel) Netherlands
K81141	+	12.12.59	Waterford/Tipperary border: c. 52°20'N. 7°25'W.
P.	ad.	14.4.60	Ushant: 48°28'N. 5°05'W. (Finistère) France
GD7669	+	12.11.60	Waringstown: 54°26'N. 6°18'W. (Down)

Woodcock (*Scolopax rusticola*)

Hki.	pull.	12.6.59	near Pori: 61°30'N. 21°45'E. Finland
B14399	+	26.1.60	Belvoir: 52°54'N. 0°48'W. (Leicester)
O.S.V.	pull.	18.6.59	Hurdal: 60°20'N. 11°02'E. (Akerhus) Norway
202	+	16.1.60	near Sutton Bridge: 52°47'N. 0°11'E. (Lincoln)

FOREIGN-RINGED RECOVERIES

J.F. 068	pull. +	20.5.57 7.2.58	Ön i Virången: 58°46'N. 16°24'E. (Södermanland) Sweden Mulroy Bay: 55°10'N. 7°40'W. (Donegal)
L. 049083	f.g. +	2.4.60 22.12.60	Mellum: 53°44'N. 8°10'E. North Sea, Germany East Ravendale: 53°28'N. 0°09'W. (Lincoln)
5383	f.g. +	15.11.55 26.12.57	Rijs: 52°52'N. 5°29'E. (Friesland) Netherlands Ruan: 52°56'N. 8°59'W. (Clare)

Curlew (*Numenius arquata*)

lei. 8120	pull. +	3.6.59 1.9.60	Töysa: 62°36'N. 23°44'E. Finland Holy Island: 55°41'N. 1°47'W. (Northumberland)
lei. 13016	pull. +	7.6.59 13.11.60	Tjock: 62°19'N. 21°35'E. Finland River Alde: 52°09'N. 1°30'E. (Suffolk)
lei. 5616	pull. +	6.6.60 3.10.60	Töysa, Finland Brancaster: 52°58'N. 0°40'E. (Norfolk)
lei. 1437	pull. +	7.6.60 11.9.60	Oulujoki: 64°58'N. 25°27'E. Finland Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
lei. 1217	pull. +	17.7.60 1.10.60	Pori: 61°30'N. 21°45'E. Finland East Mersea: 51°48'N. 0°59'E. (Essex)
095	pull. +	12.5.57 25.11.57	Staphorst: 52°38'N. 6°12'E. (Overijssel) Netherlands Bournemouth: 50°43'N. 2°00'W. (Hampshire)
9613	pull. +	11.5.58 9.9.58	Castricum: 52°33'N. 4°38'E. (Noord-Holland) Netherlands Funton: 51°23'N. 0°43'E. Medway Estuary (Kent)

Knot (*Calidris canutus*)

.. 1147	f.g. ×	26.5.57 18.12.60	Midnes: 64°04'N. 22°43'W. Iceland Foulney Island: 54°04'N. 3°10'W. (Lancashire)
rv. 1320	f.g. ×	21.9.52 4.12.60	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway Snettisham: 52°53'N. 0°31'E. (Norfolk)

Dunlin (*Calidris alpina*)

i. 2880	pull. v	1.6.60 16.8.60	Mietoinen: 60°38'N. 21°51'E. Finland Walberswick: 52°19'N. 1°39'E. (Suffolk)
i. 04152	f.g. v	23.8.59 24.8.60	Pori: 61°30'N. 21°45'E. Finland Terrington Marsh: 52°48'N. 0°18'E. (Norfolk)
i. 20534	1stW. v	20.8.60 19.11.60	Pori, Finland Harty: 51°22'N. 0°55'E. Sheppey (Kent)
P3692	f.g. v	6.7.59 26.8.60	Ledskär: 60°30'N. 17°38'E. Lövsta Bay, Sweden Dawsmere: 52°52'N. 0°08'E. (Lincoln)
X2702	f.g. v	22.7.59 24.8.60	Ledskär, Sweden Terrington Marsh (Norfolk)
3157	f.g. ×	30.8.60 26.9.60	Ledskär, Sweden Gibraltar Point: 53°06'N. 0°21'E. (Lincoln)
3293	1stW. ×	14.9.60 11.11.60	Ledskär, Sweden Tees Estuary: c. 54°38'N. 1°10'W. (York)
465	ad. v	22.7.52 24.8.60	Ottenby: 56°13'N. 16°25'E. Öland, Sweden Terrington Marsh (Norfolk)
Orn. 134	ad. v	17.8.52 24.8.60	Ottenby, Sweden Terrington Marsh (Norfolk)
Orn. 099	ad. v	28.7.58 10.8.60	Ottenby, Sweden Holbeach Marsh: 52°52'N. 0°05'E. (Lincoln)

BRITISH BIRDS

<i>St. Orn.</i> 212246	ad. v	3.8.58 11.8.60	Ottenby, Sweden Holbeach Marsh (Lincoln)
<i>St. Orn.</i> 215239	ad. v	9.7.59 10.8.60	Ottenby, Sweden Holbeach Marsh (Lincoln)
<i>St. Orn.</i> 213917	ad. v	18.7.59 26.8.60	Ottenby, Sweden Dawsmere (Lincoln)
<i>St. Orn.</i> 212024	ad. ×	1.8.58 2.1.60	Ottenby, Sweden Neston: 53°17'N. 3°04'W. (Cheshire)
<i>St. Orn.</i> 212828	ad. v	12.8.58 29.10.60	Ottenby, Sweden Harty, Sheppey (Kent)
<i>St. Orn.</i> 214771	juv. v	3.9.59 13.3.60	Ottenby, Sweden East Tilbury: 51°28'N. 0°26'E. (Essex)
<i>Stav.</i> 830062	f.g. v	25.9.58 19.3.60	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway East Tilbury (Essex)
<i>Stav.</i> 856744	f.g. v	24.8.60 1.10.60	Revtangen, Norway Harty, Sheppey (Kent)
<i>Stav.</i> 832939	f.g. v	28.9.59 11.9.60	Revtangen, Norway Cherry Cobb Sands: 53°41'N. 0°10'W. (York)
<i>Stav.</i> 849155	f.g. +	16.9.60 24.9.60	Revtangen, Norway North Ferriby: 53°43'N. 0°31'W. (York)
<i>Stav.</i> 820918	f.g. v	15.9.60 3.10.60	Revtangen, Norway Spurn Point: 53°35'N. 0°06'E. (York)
<i>Stav.</i> 834257	f.g. v	13.9.55 26.8.60	Revtangen, Norway Dawsmere (Lincoln)
<i>Stav.</i> 750223	f.g. v	6.10.58 26.8.60	Revtangen, Norway Dawsmere (Lincoln)
<i>Stav.</i> 840872	f.g. v	30.9.56 24.8.60	Revtangen, Norway Terrington Marsh (Norfolk)
<i>Stav.</i> 831519	f.g. v	9.9.58 24.8.60	Revtangen, Norway Terrington Marsh (Norfolk)
<i>C.</i> 850096	1stW. +	15.10.53 11.2.56	Amager: 55°40'N. 12°38'E. Denmark Newport: 51°34'N. 2°59'W. (Monmouth)
<i>C.</i> 825115	ad. ×	4.8.55 29.1.56	Amager, Denmark Ballymore: 53°29'N. 7°40'W. (Westmeath)
<i>C.</i> 852372	1stW. ×	15.9.55 5.2.56	Amager, Denmark Middlesbrough: 54°35'N. 1°14'W. (York)
<i>C.</i> 845258	f.g. ×	8.5.57 28.2.60	Amager, Denmark Pembrey: 51°41'N. 4°16'W. (Carmarthen)
<i>C.</i> 828861	f.g. v	27.9.59 10.8.60	Amager, Denmark Holbeach Marsh (Lincoln)
<i>C.</i> 809147	f.g. v	4.7.60 24.8.60	Amager, Denmark Terrington Marsh (Norfolk)
<i>C.</i> 845837	ad. v	28.7.60 29.10.60	Amager, Denmark Harty, Sheppey (Kent)
<i>B.</i> 33B8527	f.g. ()	9.9.60 17.12.60	Nieuwpoort: 51°08'N. 2°46'E. (West Flanders) Belgium Harty, Sheppey (Kent)

The first Dunlin on this list is the first of this species to be ringed abroad as pullus and then recovered in Great Britain.

FOREIGN-RINGED RECOVERIES

Sanderling (*Crocethia alba*)

lav.	f.g.	16.9.59	Revtangen: 58°45'N. 5°30'E. (Rogaland) Norway
56855	×	5.5.60	Tetney Lock: 53°30'N. 0°03'E. (Lincoln)

Great Black-backed Gull (*Larus marinus*)

roms.	pull.	0.7.59	Meløyvær: 69°05'N. 16°35'E. (Troms) Norway
A 37	×	23.1.60	Gore Point: 52°59'N. 0°32'E. (Norfolk)
lav.	pull.	6.7.58	Tranøy: 69°02'N. 17°15'E. (Troms) Norway
18621	×	27.1.59	Tingley: 53°44'N. 1°34'W. (York)
lav.	pull.	16.7.53	Gåsøy: 71°05'N. 24°05'E. (Finnmark) Norway
55630	×	(oiled) winter 58/59	Baltasound: 60°46'N. 0°52'W. Unst (Shetland)
lav.	pull.	6.7.55	Kinn: 61°34'N. 4°45'E. (Sogn og Fjordane) Norway
55874	×	12.9.59	East Tilbury: 51°28'N. 0°26'E. (Essex)
lav.	pull.	6.7.52	Utsira Island: 59°17'N. 4°51'E. (Rogaland) Norway
58533	+	winter 52/53	Cleethorpes: 53°34'N. 0°02'W. (Lincoln)
lav.	pull.	12.6.59	Klepp: 58°44'N. 5°33'E. (Rogaland) Norway
7198	×	A 3.3.60	Isle of May: 56°11'N. 2°33'W. (Fife)
lav.	pull.	12.6.59	Klepp, Norway
9741	×	17.4.60	Herne Bay: 51°22'N. 1°08'E. (Kent)

Lesser Black-backed Gull (*Larus fuscus*)

	pull.	16.7.56	Strömö: 62°15'N. 7°00'W. Faeroes
8862	×	20.9.56	Portrush: 55°12'N. 6°35'W. (Antrim)

Herring Gull (*Larus argentatus*)

	pull.	0.7.59	Kandalaksha: 67°02'N. 32°35'E. U.S.S.R.
72918	×	17.1.60	Aberdeen: 57°08'N. 2°05'W.

Common Gull (*Larus canus*)

Common Gulls have been recovered in considerable numbers in Britain since the report. The countries of origin were, as usual, Finland, Scandinavia, the Baltic Republics and the northern coast of Germany.

Black-headed Gull (*Larus ridibundus*)

The countries of Europe from which Black-headed Gulls come to Britain in winter are widely separated. The inland breeding-colonies of Czechoslovakia, northern Poland, Bavaria and Saxony are plentifully represented, and considerable numbers also come each year from Finland, the Baltic Republics, Scandinavia, the Netherlands and Belgium, as well as from northern Germany.

Kittiwake (*Rissa tridactyla*)

	pull.	25.6.60	Murmansk coast: 68°49'N. 37°20'E. U.S.S.R.
049	×	15.11.60	Kilbirnie: 55°46'N. 4°41'W. (Ayr)
	pull.	4.6.54	Hirsholm: 57°30'N. 10°36'E. Kattegat, Denmark
85	+	14.4.55	English Channel approaches: 49°15'N. 7°50'W.
	pull.	25.6.59	Hirsholm, Denmark
74	v	15.6.60	Lytham: 53°44'N. 2°58'W. (Lancashire)

Common Tern (*Sterna hirundo*)

L.	pull.	27.6.58	Termunten: 53°18'N. 7°05'E. (Groningen) Netherlands
290119	×	14.9.58	Starcross: 50°38'N. 3°27'W. (Devon)

Arctic Tern (*Sterna macrura*)

M.	pull.	22.6.55	Puhtu: 58°33'N. 23°31'E. Estonian S.S.R.
F289706	×	11.8.60	Oswaldkirk: 54°13'N. 1°02'W. (York)
M.	pull.	25.6.60	Puhtu, Estonian S.S.R.
P40165	×	9.8.60	Spurn Point: 53°35'N. 0°06'E. (York)

Sandwich Tern (*Sterna sandvicensis*)

L.	pull.	14.7.59	Hompelvoet: 51°47'N. 3°56'E. (Zeeland) Netherlands
404251	×	(oiled) 18.8.59	Deal: 51°14'N. 1°24'E. (Kent)

Black Guillemot (*Cepphus grylle*)

St.	pull.	22.6.60	Tistlama Lighthouse: 57°32'N. 11°45'E. Sweden
7000497	×	18.7.60	Winterton: 52°43'N. 1°43'E. (Norfolk)

This is the first foreign-ringed Black Guillemot to be recovered in Britain.

Turtle Dove (*Streptopelia turtur*)

Port.	f.g.	17.9.55	Mindelo: 41°19'N. 8°41'W. Portugal
4913	v	22.5.60	near Rochester: 51°24'N. 0°31'E. (Kent)

This is the first foreign-ringed Turtle Dove to be recovered in Britain, but the date of recovery suggests that it may have been a British-bred bird in the first place.

Long-eared Owl (*Asio otus*)

M.	f.g.	1.11.59	Ribatschi: 55°11'N. 20°49'E. (Kaliningrad) U.S.S.R.
D364176	×	1.3.60	Beaminster: 50°49'N. 2°44'W. (Dorset)

Swallow (*Hirundo rustica*)

R.	pull.	19.6.59	Schkeuditz: 51°24'N. 12°14'E. (Sachsen) Germany
H526155	×	20.7.60	Lytham: 53°44'N. 2°58'W. (Lancashire)

Fieldfare (*Turdus pilaris*)

Stav.	pull.	14.6.58	Ertvaag: 63°13'N. 8°32'E. (Nordmøre) Norway
742662	×	(9.2.59)	New Luce: 54°55'N. 4°50'W. (Wigtown)
Stav.	ad.	12.12.59	Nordfjordeid: 61°54'N. 6°00'E. (Sogn og Fjordane) Norway
754856	×	(cat) 26.2.60	North Shields: 55°01'N. 1°26'W. (Northumberland)
C.	ad.	26.1.55	Viskinge: 55°40'N. 11°15'E. (Sjaelland) Denmark
853700	×	8.5.56	Crewkerne: 50°53'N. 2°48'W. (Somerset)

Song Thrush (*Turdus philomelos*)

L.	pull.	23.5.58	Appelscha: 52°57'N. 6°20'E. (Friesland) Netherlands
K88343	×	24.10.58	Ampfield: 51°00'N. 1°26'W. (Hampshire)

Redwing (*Turdus musicus*)

Hki.	f.g.	16.4.60	Signilskär: 60°12'N. 19°22'E. Åland Is. Finland
A98250	v	27.12.60	Newcastle upon Tyne: 54°58'N. 1°40'W. (Northumberland)
B.	f.g.	18.10.56	Geel: 51°10'N. 4°59'E. (Antwerp) Belgium
3C4146	v	29.12.60	Sandon: 52°53'N. 2°05'W. (Stafford)

FOREIGN-RINGED RECOVERIES

ad.	16.8.59	Kvisker: 63°59'N. 16°27'W. Iceland
×	4.1.60	near Auchterhouse: 56°33'N. 3°02'W. (Angus)

Blackbird (*Turdus merula*)

pull.	9.6.59	Nynäshamn: 58°54'N. 17°55'E. (Stockholm) Sweden
v	20.1.60	Pitmedden: 57°21'N. 2°11'W. (Aberdeen)
ad. ♂	20.8.59	Kinkhyttan: 59°15'N. 14°50'E. (Närke) Sweden
v	17.1.60	Craignure: 56°58'N. 5°42'W. Isle of Mull (Argyll)
♂	8.4.56	Ytterby: 57°51'N. 11°48'E. (Bohuslän) Sweden
×	0.1.60	Lyng: 52°43'N. 1°04'E. (Norfolk)
pull.	8.6.55	Helleland: 58°28'N. 6°15'E. (Rogaland) Norway
×	1.3.59	Liverpool: 53°25'N. 2°58'W. (Lancashire)
pull.	1.7.56	Volda: 62°09'N. 6°04'E. (Sunnmøre) Norway
×	1.5.59	Crimond: 57°36'N. 1°57'W. (Aberdeen)
ad.	24.3.57	Kragerö: 58°52'N. 9°24'E. (Telemark) Norway
×	0.1.59	Castlereagh: 53°46'N. 8°30'W. (Roscommon)
pull.	19.6.57	Sokndal: 58°20'N. 6°17'E. (Rogaland) Norway
v ♀	26.3.59	Bamburgh: 55°36'N. 1°42'W. (Northumberland)
pull.	23.6.59	Stokke: 59°11'N. 10°19'E. (Vestfold) Norway
×	2.11.59	Huntly: 57°28'N. 2°46'W. (Aberdeen)
♂	21.2.60	Heligoland: 54°11'N. 7°55'E. Germany
×	7.3.60	Orford; 52°06'N. 1°33'E. (Suffolk)
♂	4.11.59	Oosterend: 53°06'N. 5°37'E. (Friesland) Netherlands
×	15.11.59	Tettenhall: 52°36'N. 2°11'W. (Stafford)
pull.	31.5.57	Zutphen: 52°09'N. 6°12'E. (Gelderland) Netherlands
×	4.11.57	Raglan: 51°47'N. 2°51'W. (Monmouth)

Robin (*Erithacus rubecula*)

1st W.	22.9.59	Signilskär: 60°12'N. 19°22'E. Åland Is., Finland
×	(cat) c. 11.1.60	Portland: 50°35'N. 2°30'W. (Dorset)

This is the second record of a Robin ringed on migration in the Åland Islands and recovered in south-west England. The two birds were ringed within three days of each other, but the first one was recovered less than a month afterwards (*Brit. Birds*, 53: 511).

Blackcap (*Sylvia atricapilla*)

ad. ♀	8.10.60	Heligoland: 54°11'N. 7°55'E. Germany
v	13.10.60	North Coates: 53°29'N. 0°03'E. (Lincoln)

This is the first foreign-ringed Blackcap to be recovered in Britain.

Whitethroat (*Sylvia communis*)

1st W.	14.8.57	Leerdam: 51°54'N. 5°07'E. (Zuid-Holland) Netherlands
×	23.5.58	Alvaston: 52°54'N. 1°25'W. (Derby)

Dunnock (*Prunella modularis*)

1st W.	10.10.60	Heligoland: 54°11'N. 7°55'E. Germany
v	13.11.60	Cley: 52°58'N. 1°03'E. (Norfolk)

This is the first foreign-ringed Dunnock to be recovered in Britain.

Grey Wagtail (*Motacilla cinerea*)

<i>Port.</i>	f.g.	27.10.54	Mindelo: 41°19'N. 8°41'W. Portugal
1895	v	12.4.57	near Sheffield: 53°23'N. 1°29'W. (York)

Starling (*Sturnus vulgaris*)

<i>M.</i>	juv.	9.6.58	Darwin Reserve: 58°30'N. 37°30'E. (Rybinsk) U.S.S.R.
P12098	×	winter 59/60	Great Harwood: 53°48'N. 2°24'W. (Lancashire)
<i>M.</i>	pull.	10.6.58	Darwin Reserve, U.S.S.R.
P24044	v	24.2.60	near Sutton Coldfield: 52°35'N. 1°49'W. (Warwick)
<i>M.</i>	pull.	26.5.59	Velikye Luki: 56°20'N. 30°31'E. (Pskov) U.S.S.R.
F566316	×	0.2.60	Peasenhall: 52°16'N. 1°27'E. (Suffolk)
<i>M.</i>	pull.	0.5.59	Batetski: 58°38'N. 30°31'E. (Novgorod) U.S.S.R.
F564973	×	2.4.60	Inner Dowsing Light-vessel: 53°13'N. 0°34'E.
<i>M.</i>	1stW.	5.10.59	Dukhovschina: 55°10'N. 32°27'E. (Smolensk) U.S.S.R.
F634572	v	7.2.60	Selsdon: 51°20'N. 0°03'W. (Surrey)
<i>M.</i>	juv.	6.6.55	Tartu: 58°20'N. 26°44'E. Estonian S.S.R.
F288861	+	0.1.60	Worcester: 52°12'N. 2°12'W.
<i>M.</i>	pull.	6.6.58	Tallinn: 59°26'N. 24°45'E. Estonian S.S.R.
F517843	×	2.1.60	Durham: 54°47'N. 1°34'W.
<i>M.</i>	ad.	16.3.57	Pärnu: 58°23'N. 24°30'E. Estonian S.S.R.
F288758	+	c. 20.1.60	Elmton Creswell: 53°16'N. 1°14'W. (Derby)
<i>M.</i>	juv.	28.5.59	Yaunelgava: 56°34'N. 25°02'E. Latvian S.S.R.
P41920	×	21.11.59	West Wrattling: 52°09'N. 0°20'E. (Cambridge)
<i>M.</i>	ad.	10.5.57	Simnas: 54°23'N. 23°40'E. Lithuanian S.S.R.
F347272	×	7.2.60	Northampton: 52°15'N. 0°54'W.
<i>P.V.</i>	juv.	17.5.59	Pila: 53°02'N. 16°22'E. Poland
F252021	×	20.1.60	Goodwick: 52°01'N. 4°59'W. (Pembroke)
<i>Hki.</i>	pull.	2.6.59	Strömfors: 60°34'N. 26°30'E. Finland
A92324	+	18.1.60	Stradbroke: 52°19'N. 1°16'E. (Suffolk)
<i>St.</i>	pull.	16.5.59	Älvsjö: 59°15'N. 17°57'E. (Stockholm) Sweden
YS6766	×	21.3.60	Inner Dowsing Light-vessel: 53°13'N. 0°34'E.
<i>St. Orn.</i>	ad. ♂	24.4.60	Fristad: 57°50'N. 13°00'E. (Västergötland) Sweden
704164	×	c. 20.10.60	North Kelsey: 53°30'N. 0°26'W. (Lincoln)
<i>Stav.</i>	pull.	4.6.58	Eid: 61°55'N. 5°51'E. (Nordfjord) Norway
753743	()	13.2.59	Little Bedwyn: 51°23'N. 1°33'W. (Wiltshire)
<i>Stav.</i>	pull.	3.7.59	Trysil: 61°28'N. 12°32'E. (Hedmark) Norway
743179	×	14.12.59	Caergeiliog: 53°17'N. 4°33'W. (Anglesey)
<i>Stav.</i>	pull.	5.6.57	Line: 58°43'N. 5°38'E. (Rogaland) Norway
759754	×	(cat) (24.1.59)	near Blackburn: 53°44'N. 2°29'W. (Lancashire)
<i>C.</i>	ad.	31.5.52	Korsör: 55°20'N. 11°09'E. (Sjælland) Denmark
884951	×	2.3.56	Holycross: 52°40'N. 7°50'W. (Tipperary)
<i>C.</i>	pull.	24.6.52	Fåborg: 55°06'N. 10°15'E. (Fyn) Denmark
780724	×	4.3.56	Whitehouse: 54°39'N. 5°55'W. (Antrim)
<i>R.</i>	pull.	28.5.58	near Rathenow: 52°36'N. 12°20'E. (Brandenburg) Germany
G127825	×	(30.1.60)	Halesworth: 52°21'N. 1°31'E. (Suffolk)
<i>H.</i>	pull.	28.5.58	Lingen/Ems: 52°32'N. 7°20'E. (Hanover) Germany
7184259	v	14.1.60	Fordingbridge: 50°56'N. 1°48'W. (Hampshire)
<i>B.</i>	f.g.	15.7.59	Brecht: 51°21'N. 4°40'E. (Antwerp) Belgium
5C5659	×	1.2.60	Llanllwni: 52°03'N. 4°13'W. (Carmarthen)

FOREIGN-RINGED RECOVERIES

There are, in addition, many records of Starlings ringed out of the breeding-season or during migration in Scandinavia, Germany, Holland and Belgium. More cases have also been brought to our notice of Starlings being experimentally intercepted in Holland during the autumn movements and released in Switzerland. The British recoveries of such transported birds are given in detail below.

	ad. ♂	7.11.53	Loosduinen: 52°04'N. 4°15'E. Netherlands
	transp.		Geneva: 46°12'N. 6°10'E. Switzerland
21706	×	0.1.56	North Creake: 52°55'N. 0°46'E. (Norfolk)
	1st W. ♂	16.10.54	Loosduinen, Netherlands
	transp.		Zürich: 47°22'N. 8°33'E. Switzerland
22392	×	22.3.58	Caddington: 51°52'N. 0°27'W. (Bedford)
	1st W. ♂	23.10.54	Loosduinen, Netherlands
	transp.		Basle: 47°34'N. 7°35'E. Switzerland
22627	×	25.2.57	Enfield: 51°40'N. 0°05'W. (Middlesex)
	ad. ♀	5.11.55	Wassenaar: 52°09'N. 4°22'E. Netherlands
	transp.		Basle, Switzerland
20500	×	4.3.58	Bonvilston: 51°28'N. 3°21'W. (Glamorgan)
	f.g.	25.10.57	Wassenaar, Netherlands
	transp.		Basle, Switzerland
2136	v	11.1.60	Great Kingshill: 51°41'N. 0°46'W. (Buckingham)
	1st W. ♂	25.10.57	Wassenaar, Netherlands
	transp.		Basle, Switzerland
1994	+	4.1.59	Lancast: 50°38'N. 4°30'W. (Cornwall)
	ad. ♀	25.10.57	Wassenaar, Netherlands
	transp.		Basle, Switzerland
1959	×	19.10.58	Yarmouth Roads: 52°37'N. 1°47'E. (Norfolk)
	1st W. ♂	7.11.57	Wassenaar, Netherlands
	transp.		Zürich, Switzerland
2804	[?]	19.12.59	Callington: 50°30'N. 4°18'W. (Cornwall)
	1st W. ♂	13.11.57	Wassenaar, Netherlands
	transp.		Zürich, Switzerland
2953	×	24.2.59	Weston: 52°26'N. 1°34'E. (Suffolk)

Greenfinch (*Chloris chloris*)

	♀	3.4.60	Meulebeke: 50°55'N. 3°16'E. (West Flanders) Belgium
48	×	17.4.60	Stoke Mill: 52°33'N. 1°18'E. (Norfolk)
	ad. ♂	16.2.60	Tourcoing: 50°44'N. 3°10'E. (Nord) France
173	×	7.5.60	Scole: 52°22'N. 1°10'E. (Norfolk)
	ad. ♀	3.1.60	Fromelles: 50°37'N. 2°52'E. (Nord) France
369	×	4.5.60	Needham: 52°23'N. 1°17'E. (Norfolk)
	ad. ♂	17.1.60	Vannes: 47°40'N. 2°44'W. (Morbihan) France
752	×	20.4.60	Chesham: 51°43'N. 0°36'W. (Buckingham)

Siskin (*Carduelis spinus*)

	ad. ♂	15.3.59	Johanngeorgenstadt: 50°26'N. 12°44'E. (Sachsen) Germany
0347	×	0.2.60	Whatton: 52°56'N. 0°54'W. (Nottingham)
	1st W. ♀	2.10.57	Wassenaar: 52°08'N. 4°20'E. (Zuid-Holland) Netherlands
182	×	19.3.60	Playford: 52°05'N. 1°14'E. (Suffolk)
	f.g.	17.10.59	Wilrijk: 51°09'N. 4°24'E. (Antwerp) Belgium
6437	×	7.2.60	Chilwell: 52°55'N. 1°14'W. (Nottingham)

Bullfinch (*Pyrrhula pyrrhula*)

L.	ad. ♂	3.11.54	Leerdam: 51°54'N. 5°06'E. (Zuid-Holland) Netherlands
H31109	+	14.2.60	Mereworth: 51°16'N. 0°23'E. (Kent)

This is the first foreign-ringed Bullfinch to be recovered in Britain.

Chaffinch (*Fringilla coelebs*)

Hki.	ad. ♂	20.7.60	Pori: 61°30'N. 21°45'E. Finland
P55411	v	25.10.60	Spurn Point: 53°35'N. 0°06'E. (York)
H.	1stW. ♀	17.9.59	Heligoland: 54°11'N. 7°55'E. Germany
8981095	v	12.3.60	Brentwood: 51°38'N. 0°18'E. (Essex)
H.	ad. ♂	20.9.59	Heligoland, Germany
8981314	v	13.2.60	Ballickmoyler: 52°53'N. 7°01'W. (Leix)
L.	♂	10.10.54	Loosduinen: 52°03'N. 4°12'E. (Zuid-Holland) Netherlands
1114764	×	5.12.57	Garstang: 53°54'N. 2°47'W. (Lancashire)
L.	1stW. ♂	8.11.54	Loosduinen, Netherlands
H28932	v	17.1.60	Colchester: 51°54'N. 0°55'E. (Essex)
L.	1stW. ♀	11.10.58	Wassenaar: 52°08'N. 4°20'E. (Zuid-Holland) Netherlands
A61366	×	1.11.58	St. Bees Head: 54°31'N. 3°39'W. (Cumberland)
L.	ad. ♂	13.10.58	Wassenaar, Netherlands
A61563	v	17.1.60	Colchester (Essex)
L.	1stW. ♂	13.10.52	Leerdam: 51°54'N. 5°06'E. (Zuid-Holland) Netherlands
H19016	×	28.1.58	Clydach: 51°42'N. 3°55'W. (Glamorgan)
L.	♂	26.10.57	Bennekom: 52°00'N. 5°41'E. (Gelderland) Netherlands
H95076	×	23.3.58	Snodland: 51°20'N. 0°27'E. (Kent)
L.	♀	9.10.57	Bennekom, Netherlands
H71947	×	3.4.58	Findon: 50°52'N. 0°25'W. (Sussex)
L.	♂	12.10.58	Breda: 51°35'N. 4°45'E. (Noord-Brabant) Netherlands
H95397	×	12.12.58	Kill: 53°15'N. 6°35'W. (Kildare)
L.	♀	29.7.52	Baarle Nassau: 51°26'N. 4°55'E. (Noord-Brabant) Netherlands
F75284	×	17.3.58	Reading: 51°28'N. 0°59'W. (Berkshire)
B.	f.g.	19.10.58	Brasschat: 51°57'N. 4°30'E. (Antwerp) Belgium
25A7888	/?/	4.3.59	Canterbury: 51°16'N. 1°05'E. (Kent)
B.	f.g.	17.10.59	Ekeren: 51°17'N. 4°25'E. (Antwerp) Belgium
29B4027	×	15.3.60	Bromley: 51°24'N. 0°03'E. (Kent)
B.	♀	30.10.59	Ekeren, Belgium
30B9422	×	22.1.60	Welwyn Garden City: 51°46'N. 0°12'W. (Hertford)
B.	♀	19.10.58	Knokke: 51°20'N. 3°17'E. (West Flanders) Belgium
17B7204	×	4.5.60	Banbury: 52°03'N. 1°20'W. (Oxford)
B.	♀	20.10.58	Knokke, Belgium
17B7283	×	1.4.60	Great Barford: 52°09'N. 0°21'W. (Bedford)

Brambling (*Fringilla montifringilla*)

B.	♂	18.2.58	Merksplas: 51°52'N. 4°52'E. (Antwerp) Belgium
21A59	v	14.1.60	Spurn Point: 53°35'N. 0°06'E. (York)

Tree Sparrow (*Passer montanus*)

P.	f.g.	29.9.59	Cap Gris Nez: 50°52'N. 1°35'E. (Pas-de-Calais) France
09232	v	3.10.60	Stockbury: 51°20'N. 0°40'E. (Kent)

This is the first foreign-ringed Tree Sparrow to be recovered in Britain.

Short index of English names of birds

This simplified index is confined to the numbers of the first pages of papers, notes and letters on the species concerned. Casual references to other species within the text are not included, nor are birds discussed in reviews or in the "Recent reports and news". However, such lists as the "Report on bird-ringing for 1960" and the "Report on rare birds in Great Britain in 1960" are completely indexed here.

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Bird observatories in Great Britain and Ireland

list is arranged alphabetically and is designed to give (i) the name of the warden or director where there is one; (ii) the address from which particulars may be obtained; and (iii) an indication of accommodation charges and travel routes (charges are, of course, liable to alteration). *Stamped envelopes should be enclosed with applications for particulars.*

ADSEY BIRD AND FIELD OBSERVATORY, Caernarvonshire, N. Wales. *Warden:* Frank Clifton. *Write to:* G. C. Lambourne, The Cottage Farm, Ipsley, Redditch, Worcestershire. *Accommodation:* 4/- to 5/- per night; evening meal available in certain weeks at 5/-. *Station:* Pwllheli. *Boat from Aberdaron:* 11/- return.

ADWELL BIRD OBSERVATORY, Bradwell-on-Sea, Essex. *Write to:* A. B. Old, Bata Hotel, E. Tilbury, Essex. *Accommodation:* 2/6 to 4/- per night. *Station:* Southminster (bus to Bradwell).

ADRIAN CLEAR ISLAND BIRD OBSERVATORY, Co. Cork, Ireland. *Write to:* H. M. Robinson, Old Barn, Sonning Common, Reading, Berkshire. *Accommodation:* 3/- per night. *Travel:* bus from Cork; island boat from Baltimore 4 days a week, 10/- return.

ADRIAN BIRD OBSERVATORY, Holt, Norfolk. *Warden:* R. A. Richardson, Hill Top, Cley, Holt, Norfolk. *Accommodation:* cottage or hotel in Cley village. *Details from:* The Secretary, Green Farm House, Cley, Holt, Norfolk. *Station:* Holt (4 miles).

ADRIAN BIRD OBSERVATORY, N. Ireland. *Write to:* J. Wilde, 25 Kingsland Park, Rock, Belfast 5. *Maintenance charge to non-members:* 2/6 per day. *Bus and boat from Belfast:* 1/6 return.

ADRIAN BIRD OBSERVATORY, Romney Marsh, Kent. *Warden:* R. E. Scott. *Write to:* H. A. R. Cawkell, 6 Canute Road, Hastings, Sussex. *Accommodation:* 5/- per night. *Station:* Lydd-on-Sea.

ADRIAN BIRD OBSERVATORY, Shetland. *Warden:* Peter Davis, who will supply a prospectus and arrange bookings. *Accommodation and board:* 15/- to £1 per night. *Station:* Aberdeen; then by steamer to Lerwick or by B.E.A. aeroplane to Sumburgh. *Island boat:* 1s. 6d. return.

ADRIAN BIRD OBSERVATORY, near Egness, Lines. *Bookings:* A. E. Smith, Pyewipes, Willoughby, Alford, Lines. *Research:* K. Cornwallis, Bleasby Grange, Legsby, Market Rasen, Lines. *Accommodation:* 6/- per night. *Station:* Skegness.

ADRIAN BIRD OBSERVATORY AND FIELD STATION, Fife. *General correspondence:* Dr. W. J. Eggeling, Nature Conservancy, 12 Hope Terrace, Edinburgh 9. *Bookings:* Macdonald, Hadley Court, Sidegate, Haddington, East Lothian. *Accommodation:* 5/- per night. *Station:* Pittenweem. *Boat:* 15/- return.

ADRIAN BIRD OBSERVATORY, St. Owen's Nature Reserve, Jersey, C.I. *Write to:* A. le Hur, 6 York Street Chambers, St. Helier, Jersey. *Accommodation and board:* 7-9 gns. per week depending on the time of year (seaside café, "Pro Tem"). *Travel:* boat from Weymouth prox. £4 14s. 6d., 2nd class return) or by air.

ADRIAN BIRD OBSERVATORY, via Bideford, Devon. *Warden:* Michael Nes. *Write to:* J. Dyke, 8 Rock Avenue, Barnstaple, Devon. *Accommodation:* 5/- per night. *Station:* Bideford. *Boat:* M.V. *Lundy Gannet* from Bideford Quay, £2 10s. return; or Campbell from Ilfracombe Pier, £1 17s. return.

ADRIAN BIRD OBSERVATORY, Slimbridge, Gloucestershire (Headquarters of the Wildfowl Trust). *Director:* Peter Scott. *Assistant Director (Research):* Dr. G. V. T. Matthews. *Write to:* Bookings Secretary, at address above.

ADRIAN BIRD OBSERVATORY AND FIELD CENTRE, Portland Bill, Dorset. *Warden:* J. Morgan. *Bookings:* A. J. Bull, The Gallop, Bryanston, Blandford, Dorset. *Records:* J. S. Ash, Game Research Station, Fordingbridge, Hants. *Accommodation:* 5/- per night.

ADRIAN BIRD OBSERVATORY, Co. Wexford, Ireland. *Write to:* Major R. F. Attledge, Moorefield, Ballybraek, Co. Dublin, Ireland. *Accommodation:* 2/6 per night. *Station:* Bridgetown (boat from Fishguard to Rosslare; train from Rosslare to Bridgetown). *Travel to island:* £1 return.

ADRIAN BIRD OBSERVATORY, Dale, Haverfordwest, Pems. *Warden:* Don Glanville. *Write to:* The Warden, Dale Fort Field Centre, Haverfordwest, Pems. *Accommodation and board:* £7 10s. per week (amateurs £7). *Car and boat:* £1 return.

ADRIAN BIRD OBSERVATORY, Kilnsea, Yorks. *Warden:* P. J. Mountford. *Write to:* G. H. Isworth, 144 Gillshill Road, Hull. *Accommodation:* 4/- per night (3/- to Y.N.U. Members). *Stations:* Hull (bus to Kilnsea) or Patrington (taxi or bus).

ADRIAN BIRD OBSERVATORY, Co. Donegal, Ireland. *Write to:* R. G. Pettitt, Charlotte Street, London, W.1. *Accommodation:* 10/- per week (5/- if staying in village). *Station:* Londonderry or Strabane (bus to Gortahawk). *Boat:* £2 return.

In addition to the above observatories, representatives from each of which form the Bird Observatories Committee, there are several which have not yet applied for formal recognition. These include: St. Agnes (Isles of Scilly), Sandwich Bay (Kent), the Calf of Man (I.o.M.) and Orswick (Suffolk). Enquiries concerning these stations may be made through the Ringing Committee.

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2. p. A brief history of bird-ringing in
Great Britain and Ireland

Although from 1890 there had been several enterprises of limited scope, bird-ringing on a large scale in this country began in 1909 with the independent launching of two schemes—one by H. F. Witherby in connection with *British Birds* (rings marked “Witherby High Holborn London”), and the other by A. Landsborough Thomson in Scotland (rings marked “Aberdeen University”). Of these, the first-mentioned developed into the national scheme of today; the other came to an end during the First World War, its promoter afterwards becoming associated with Witherby’s scheme.

In 1937 Witherby transferred the control of his scheme to the British Trust for Ornithology, which appointed a Bird-Ringing Committee to manage it: Miss E. P. Leach, who had latterly assisted Witherby, carried on the work as Honorary Secretary of this Committee. At the same time, the headquarters were moved to the British Museum (Natural History) where the Trustees had agreed to provide accommodation and also to allow the use of the Museum address on rings. *British Birds* continued to support the scheme and to be the chief medium of publication. The Leverhulme Trust made a non-recurrent grant for special projects.

For a long time the scheme was mainly self-supporting, all the ringers paying—as they normally still do—for the rings they used. Its rapid growth after the Second World War, however, eventually made it impossible to maintain the ever-increasing load of headquarters work on a voluntary basis, although some help towards expenses was afforded from the general funds of the Trust. Fortunately, the Nature Conservancy agreed to give financial support, at first on a small scale but from 1954 in an annual amount to cover the salaries of a whole-time Ringing Officer (Robert Spencer) and other staff.

This substantial support and the continuing active co-operation of so many ringers are evidence of the importance attached to the scientific results. A report on progress, with a selected list of recovery records, is published each year in *British Birds*, an extra number of the journal now being entirely devoted to this and related purposes. Analyses of particular sections of the accumulated data are also published from time to time.

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